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Environmental Assessment

Prairie Project

Mt. Magazine Ranger District
Ozark National Forest
Yell County, AR

Contact Person: Rob Kopack
Mt. Magazine Ranger District
P.O. Box 511
Paris, AR 72855
Phone: 479-963-3076

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ENVIRONMENTAL ASSESSMENT
FOR
COMPARTMENTS 1, 14, 55, AND 56
OZARK NATIONAL FOREST
MT. MAGAZINE RANGER DISTRICT
YELL COUNTY, ARKANSAS

I. INTRODUCTION

A. DOCUMENT STRUCTURE

The Forest Service has prepared this Environmental Assessment (EA) in compliance with the National Environmental Policy Act (NEPA) and other relevant Federal and State laws and regulations. This Environmental Assessment discloses the direct, indirect, and cumulative environmental impacts that would result from the Proposed Action and alternatives. This document is organized into five parts:

- *Introduction:* The section includes the purpose of and need for the project and the agency's proposal for achieving that purpose and need. This section also details how the Forest Service informed the public of the proposal and how the public responded.
- *Comparison of Alternatives:* This section provides a more detailed description of the agency's proposed action as well as the no action alternative. The proposed action alternative was developed based on issues raised by the public and other agencies. This discussion also includes possible mitigation measures. Finally, this section provides a summary table of the environmental consequences associated with both alternatives.
- *Environmental Consequences:* This section describes the environmental effects of implementing the proposed action and other alternatives. This analysis is organized by resource area.
- *Agencies and Persons Consulted:* This section provides a list of preparers and agencies consulted during the development of the environmental assessment.
- *Appendices:* The appendices provide more detailed information to support the analyses presented in the environmental assessment.

Additional documentation, including more detailed analyses of project-area resources, may be found in the project planning record located at the Mt. Magazine Ranger District Office in Paris, Arkansas.

B. PURPOSE AND NEED FOR ACTION

The purpose and need for action are to implement the Revised Land and Resource Management Plan (RLRMP) for Ozark-St Francis National Forests. See map 12 page 109 for location of each Management Area (MA). Emphasis and desired conditions for MAs within the project are as follows:

1. Maintain or enrich forest vigor by reducing tree stocking. Reduced tree stocking would promote vigor by decreasing the overall demand for water and nutrients by residual vegetation. Trees with adequate water and nutrient supplies are better able to withstand drought and are less likely to succumb to attacks by insects or disease.

2. Provide viability needs in early seral successional habitat (0-5 years old).

3. Continue the process of balancing age classes for diversity and forest health.

4. Lessen the possibility of catastrophic wildland fires (especially in drought years) by reducing the amount of burnable fuels, increase forage production of grasses and forbs for wildlife, and maintain or expand native ecosystems that are dependent on periodic fires.

5. Provide quality wildlife habitat.

6. Reduce impacts to wildlife and limit erosion potential on certain roads not needed for management in the near future throughout the project area.

7. Provide forest products consistent with land capability, suitability, protection of needs, and other resource values.

8. Control invasive species in the project area.

9. Provide stream habitat management.

10. Allow salvage/sanitation thinning to areas within close proximity to Spring Lake for safety, forest health or public utilization of downed trees.

11. Allow salvage of damaged trees across the project area created by events such as drought, wind events, ice storms, beetle infestations, or diseases.

These actions are needed because:

1. Need to Promote Healthy Forests

There are many factors both climatic and physical that may influence a trees health. Some of these are drought, being root sprung, boles broken because of an ice storm, or over stocking. When a tree becomes stressed, its defenses are weakened and may be overwhelmed by an insect infestation or disease or a combination of both.

Pine boring beetles (e.g., black turpentine beetle, ambrosia beetle) and pine bark beetles (e.g., Ips engraver beetle, southern pine beetle, southern pine sawyer) can attack and overwhelm unhealthy stressed pine forests. Once insect infestations start, it is too late to effectively treat large areas and many acres of trees rapidly die. Prevention is the best control method. Thinning stands reduces competition and moisture stress. By keeping the trees healthy, beetles are often exuded from the trees by pitch and are less likely to reach epidemic proportions.

Upland hardwood trees are also susceptible to many insects and diseases. The annual combined loss due to insects and diseases is often more than the losses to forest fires. Some losses to insects and diseases are unavoidable. However, most losses can be avoided through proper forest management. Maintaining healthy stands by promoting tree vigor helps to avoid these losses.

2. Need To Improve Wildlife Habitat Through Establishment Of Early Seral Habitat

The Forest provides a wide variety of habitats that support a diversity of wildlife species. One of the most important is the early seral successional habitat (0-5 years old). The overall amount of early successional forest on the Ozark National Forest decreased slightly from 2008 to 2009 (U.S. Department of Agriculture, 2010a). The amount of early successional habitat created on the Forest is tied very closely to the amount of regeneration harvests the Forest conducts in a given year. This type of harvesting has declined over the years and this has driven the decline in early successional habitat. At the current time in the project area, there are no forested acres in the 0-5 year old age class to provide this early successional habitat.

Four of the Management Indicator Species (MIS) from the RLRMP are dependent upon early successional habitat. As shown in the paper Management Indicator Species Population and Habitat Trends (U.S. Department of Agriculture Forest Service, 2001), although deer populations appear to be increasing based on harvest data, it is possible that the decline in early seral habitat could alter this trend. There is a need to maintain a portion of the habitat in early stages to maintain quality bear habitat over time. The yellow-breasted chat population appears to be stable or increasing possibly due to prescribed fire or natural events. The uncertainty and unpredictability of these events would not guarantee existence of quality habitat for chat.

3. Need To Balance Age Class

The pine type age classes in this analysis area are not in balance. The age class distribution is weighted heavily in the 41-70, 71-100 and 101+ year-old age class. Approximately 75% of the pine type acres are in these age classes. If no new acres are regenerated, the majority of the analysis area would get old at comparatively the same time. Breaking up the age classes now would help prevent substantial mortality from insects and/or disease later. The effects of poor management could cross the project area boundary impacting other possibly healthy forested acres both government and private lands.

4. Need to Maintain and Expand Fire in the Ecosystem

Approximately three quarters of the project area was prescribed burned during the last burning cycle. Forest fuels accumulate rapidly in pine stands. In 5 to 6 years, heavy fuel layers can build up from normal growth,

posing a serious threat from wildfire to all forest resources. Prescribe fire is the most practical way to reduce dangerous accumulations of combustible fuels. Wildfires that burn into areas where fuels have been reduced by prescribed burning cause less damage and are much easier to control. The prescribed burning boundary is planned for expansion to include the southern portions of Compartments 1 and 55 to achieve the benefits described above.

In this analysis area, approximately 1412 acres (33% of project acres) are located within the Wildland Urban Interface (WUI). WUI areas are National Forest land that is within one-quarter of a mile from private land. These areas are at risk of a wildland fire that may occur within the National Forest lands that border these private lands.

This analysis area was once a fire-dominated ecosystem. Frequent fires top killed shade tolerant species providing ample forage for many species of wildlife. Past management practices have maintained fire in Compartments 14 and 56 and the northern half of Compartments 1 and 55. Where fire has been maintained, the understory is open allowing good site distances into the forest. Areas where fire has typically not been a management practice has created a situation where shading and buildup of duff or needle layers has reduced or possibly eliminated grasses and forbs. The loss of these grasses and forbs is reducing the number of small mammals, seed-eating birds, as well as some species such as deer and turkey. A heavier duff layer increases the potential for a wildfire and its uncontrolled effects on the flora or fauna.

5. Need To Provide Quality Wildlife Habitat

Well-managed wildlife openings provide quality wildlife forage for species such as deer and bugging areas for turkeys. The RLRMP objective is to have at least twenty-eight wildlife openings for this project area. Currently, there are three wildlife openings in the project area. Eight new wildlife openings need to be constructed to help move towards meeting the RLRMP objectives.

Three existing wildlife openings need to be restored to provide more edge, forage, and turkey brood habitat than is currently being produced.

6. Need To Manage The Transportation System While Reducing Wildlife Impacts And Erosion Potential

Certain roads within the project area are no longer needed for management in the near future. Their continued use by the public creates an unfavorable situation for wildlife through unnecessary disturbance and adds to soil loss through erosion.

7. Need To Provide Commodities

One output of achieving the needs of the project area would be harvesting of timber. The project area is in Management Area 3.A (Pine Woodland), Management Area 3.C (Mixed Forest), and Management Area 3.I (Riparian Corridors). These management areas are classified as suitable for timber management (RLRMP, pgs. 2-56, 2-61, and 2-74).

Management Area 2.C (Developed Recreation Area) is classified as unsuitable for timber production (RLRMP, pg. 2-50). Timber management in this area would only be for safety purposes, forest health, or public utilization of downed trees.

8. Need To Control Invasive Species in the Project Area

Within the Prairie Project area, there are occurrences of nonnative invasive species (NNIS). Species such as, Sericea lespedeza, *Lespedeza cuneata*, have become the dominant species along roadsides. Privet has also been identified within the project area. Treatment of these nonnative species and other NNIS is needed to prevent these species from becoming over abundant and causing negative effects on native plant species.

9. Need to Perform Stream Habitat Improvement Management

It was determined during stream surveys conducted in the summer of 2005 that some project streams were in need of large woody debris according to Objectives 22 and 23 from the RLRMP. Wood in the streambed helps to slow the water flow, extend the water supply further into the dry season, and provide additional habitat for amphibians and fish.

Two road/stream crossings within the project area were found during the inventory to be barriers to movement/migration of aquatic organisms within the stream channel. These road/stream crossings are in

need of structures that would allow for movement of aquatic organisms through the structure along with large wood and rock that also are moved through the stream system during higher flows.

10. Need to Allow Salvage/Sanitation Thinning Around Spring Lake

Salvage/sanitation thinning around Spring Lake is needed to promote safe conditions for visitors in a developed recreation area. Other benefits of these actions will promote scenic aesthetics, utilization of dead trees for campfires or removal of damaged trees to prevent additional damage from insects to adjacent trees.

11. Need Ability to Salvage Across Project Area

The ability to salvage timber expeditiously is good stewardship. Without the option of salvaging timber after a damaging event prevents utilizing the timber in a condition most similar to its condition prior to the damaging event.

C. PROPOSED ACTION

The Prairie Project area encompasses approximately 4595 acres of National Forest land.

There are approximately 672 acres of private ownership project area boundary.

The Mt. Magazine Ranger District proposes the following actions shown in Table 1 for Compartments 1, 14, 55, and 56. This area is located approximately nine air miles south-southeast of New Blaine, Arkansas, in Yell County (See Vicinity Map, page 5). This area is in the southeast corner of the Mt. Magazine Ranger District located in T6N, R22W and R23W.

Map 1: Vicinity Map

Table 1: Proposed Action[1]

Treatment Description	Total*
Shortleaf Pine Shelterwood Harvesting	378 Acres
Shortleaf Pine/Loblolly Pine Thinning	2693 Acres
Salvage/Sanitation Thin	173 Acres
Cedar Thinning	4516 Acres
Shortleaf Pine Seedtree Removal	457 Acres
Temporary Road Construction	15.7 Miles
Road Construction	0.6 Miles
Road Reconstruction	11.0 Miles
Road Decommissioning	5.2 Miles
Road Maintenance	4.2 Miles
Shortleaf Pine Site Preparation	378 Acres
Shortleaf Pine Planting	378 Acres
Shortleaf Pine Release	633 Acres
Non-native Invasive Species Treatment	Up to 700 Acres/Year
Wildlife Opening Construction/Restoration[2]	8 Openings
Wildlife Opening Restoration[3]	3 Openings
Wildlife Stand Improvement/Riparian Stand Improvement	557 Acres
Wildlife Habitat Improvement/Fuels Reduction Prescribed Burning[4]	4516 Acres
Stream Habitat Management	13 Miles
Aquatic Organism Passage Construction	2 Each
Lake Habitat Improvement – Fish Structures	Up to 50
Linear Food Plot	4 Acres
OHV Trail Addition	3.4 Miles
Salvage Across Project Area	4343 Acres

[1] Acres and miles are approximations

[2] Proposed for two restoration treatments on a two-year rotation

[3] Proposed for two additional follow-up restoration treatments on a two-year rotation.

[4] Proposed for four treatments for burning on a three- to four-year rotation

D. DECISION FRAMEWORK

The decision to be made is whether to implement the Proposed Action (Alternative 1) or the No Action Alternative (Alternative 2). Rob Kopack, Deputy District Ranger of the Mt. Magazine Ranger District, or his acting line officer has the authority to make this decision.

E. RELATED EIS/EA(S) THAT INFLUENCE THE SCOPE OF THIS ENVIRONMENTAL ASSESSMENT

This EA is tiered to the Ozark-St. Francis NFs Final Environmental Impact Statement (Ozark-St. Francis FEIS) and the Revised Land and Resources Management Plan (RLRMP). The Ozark-St. Francis FEIS and the RLRMP can be viewed at local U.S. Forest Service offices or at http://www.fs.usda.gov/main/osfnf/landmanagement/planning. Other documents incorporated by reference in this EA can be viewed at the Mt. Magazine District office in Paris, Arkansas.

F. PUBLIC INVOLVEMENT

Scoping for this project began with the mailing of the proposed action to adjacent landowners and interested citizens on December 03, 2012. This list included letters to eight Native American Tribes and the Arkansas Game and Fish Commission, landowners, organizations and individuals that have asked to be put on the District or Forest mailing list. The scoping package contained a description of the proposed action, a map depicting the proposed action, and a comment form. Fifty-five (55) letters were mailed.

A copy of the proposed action letter was posted that same week on the Ozark-St. Francis National Forests website at http://www.fs.usda.gov/detail/osfnf/landmanagement/planning.

This project was also listed in the Schedule of Proposed Actions and posted on the Ozark-St. Francis National Forests website at http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5291930.pdf

One public response was received during the 30 day request for comments on the draft EA. Comments related to the draft EA are shown in Appendix E.

G. ISSUES

Issues serve to highlight effects or unintended consequences that may occur from the proposed action, providing opportunities during the analysis to explore alternative ways to meet the purpose and need for the proposal while reducing adverse effects. Issues identified early in the process during scoping help set the scope of the actions, alternatives, and effects to consider.

Concerns related to forest management such as sustainability, road management, water quality, soils, air quality, climate change, visuals, recreation, heritage resources, minerals, wildlife, fisheries, proposed, endangered, threatened and sensitive species were thoroughly integrated into the project proposal and were not identified as issues that would require a separate alternative to resolve the concerns.

Four responses to scoping have been received as of January 8, 2013; all were reviewed by the interdisciplinary team assigned to this project (refer to page 87). Though one response was in opposition of the proposed action, all other responses were supportive of the project. No issues that were not previously considered during the development of the proposed action were identified. The project planning record includes a copy of the scoping letter, a list of persons to whom the letter was mailed, and copies of all responses received to date.

II. ALTERNATIVES INCLUDING THE PROPOSED ACTION

This chapter describes and compares the alternatives considered for the Prairie Project. There was only one alternative developed in detail. The No Action alternative is compared to the Proposed Action. No other alternatives were developed in detail.

The mission of the Forest Service is to "sustain the health, diversity, and productivity of the nation's forests and grasslands to meet the needs of present and future generations." The resource management function is responsible for the long term health and sustainability of the forest, providing goods and services from the land, the quality of the water running on and under the land, air quality above the land, habitat for wildlife, and protecting species of plants and animals from extinction. (RLRMP 2005)

The Proposed Action was developed from the RLRMP including the mission of the Forest Service plus customized direction for the MAs within the project boundary. The MAs within the project boundary are 2.C-Developed Recreation, 3.A - Pine Woodland, 3.C - Mixed Forest, and 3.I - Riparian Corridors.

A brief description of each MA follows. See Map 12 for a location of each MA except MA 3.I Riparian Corridor. It is included in the other management areas.

2.C Developed Recreation Areas

Emphasis

This management area occurs on approximately 186 acres in the project. Developed recreation areas are managed to provide the public with a variety of recreational opportunities in visually appealing and environmentally healthy settings. Facilities are provided to enhance the quality of the recreational experience and to mitigate damage to the affected ecosystems. These areas also serve as "gateways" to the wide diversity of recreation opportunities on the remainder of the Forests. This area is unsuitable for timber production

Desired Condition

Due to the high level of recreational use and the management for aesthetics and safety, vegetation is greatly influenced by humans. Vegetative management for forest health is appropriate to maintain the long-term goals of a diverse and vigorous forest emphasizing recreation, scenery, and visitor safety. It is also an appropriate management tool to provide improved threatened, endangered, sensitive, and locally rare species habitat; to reduce fuel buildups; or to control non-native invasive vegetation and pests. Integrated pest management is used to eradicate or suppress insects, diseases, and non-desirable invasive vegetation. Prescribed fire is used to enhance recreational settings and to reduce fuels for protection of infrastructure investments.

3.A Pine Woodland

Emphasis

This management area occurs on approximately 2610 acres in the project area. This MA is suitable for timber production. The primary emphasis in this MA is to restore and maintain a landscape mosaic of open pine woodland that approximates historical conditions. The purpose is to provide habitat for associated plants and animals, some of which are rare and declining, and to create a setting for recreation that is different, uncommon, visually appealing, and rich in wildlife.

Restoration and maintenance of pine woodland is accomplished through application of a variety of forest management practices. Thinning of trees is often needed to create initial open-canopy conditions, and may be achieved through manual, mechanical, or chemical methods including use of commercial timber sales. Frequent prescribed fire (often applied at landscape scales) may be used to thin trees, and is the predominate method used to maintain open conditions and well-developed understory communities. Regeneration of woodland occurs on a scheduled basis to diversify age class distribution to ensure a sustained supply of this habitat over time.

Desired Condition

This area is characterized by a mosaic of woodland and forest with pine woodland occupying approximately 60 percent of the total community acreage, and typically occurring on ridges and south- to-west facing aspects. Generally, patches of pine woodlands are well connected in networks of ridges and other suitable sites incorporating other fire-dependent communities such as glades and barrens. Forests (> 60% canopy

closure) are present on lower slopes and drains, with most being in an open condition (60 to 80% canopy closure).

Pine woodlands have open canopies (10 to 60% canopy closure), sparse midstories, and well-developed understories that are typically dominated by grasses and forbs, but also may have a significant woody component. The density of the overstory and midstory and the woody component of the understory generally increase as one moves down slope and onto north and east aspects, gradually merging with more typical forest conditions.

3.C Mixed Forest
Emphasis
This management area occurs on approximately 1720 acres in the project area. These lands are managed to ensure the health and sustainability of the pine, pine/hardwood, hardwood/pine, and hardwood forest types across the landscape. Timber will be a by-product of vegetation management aimed at maintaining sustainable ecosystems. This area is suitable for timber production.

Light levels to the forest floor are managed to develop an assemblage of desirable regeneration and to maintain a moderate herbaceous component. This is accomplished through silvicultural activities including prescribed fire as well as mechanical and chemical vegetation control. The difference between this management area and the pine woodland MA is that stocking levels of trees in this MA are denser than the stocking levels in the pine woodland MA.

Desired Condition
The character of the land is predominately natural appearing with a diversity of forest successional classes and ecological community types. Thinning, prescribed fire at regular intervals, and regeneration harvests are common silvicultural treatments. Stands are regularly thinned to reduce stress as trees age. Fire is common, typically as a result of prescribed burning.

Other communities that occur on low productivity sites (e.g., glades) typically comprise a small proportion of the area. Where they occur; however, they exhibit high levels of ecological integrity and diversity of characteristic species. Rare communities within the management area are maintained at desired composition, structure, and function. They support characteristic associations of species. Occurrences for threatened and endangered species are stable or expanding as are those for sensitive and locally rare species, which are needed to provide for their viability.

3.I Riparian Corridors
Emphasis
Riparian corridors are managed to retain, restore, and enhance the inherent ecological processes and functions of the associated aquatic, riparian, and upland components within the corridors. Silviculture treatments including timber and vegetation removal may occur to restore and/or enhance riparian resources such as water, wildlife, and natural communities.

Desired Condition
Riparian corridors reflect the physical structure, biological components, and ecological processes that sustain aquatic, riparian, and associated upland functions and values. The preferred management for riparian corridors is one that maintains, or moves toward, the restoration of processes that regulate the environmental and ecological components of riparian areas.

These areas are suitable for timber management. Vegetation management activities take place to maintain, restore, and/or enhance the diversity and complexity of native vegetation; rehabilitate both natural and human-caused disturbances; provide habitat improvements for aquatic and riparian associated wildlife species (including migratory birds). Silvicultural treatments including timber and vegetation removal may occur within the riparian corridor. Prescribed fire can be used within the corridor to create or maintain the composition and vitality of fire-dependent vegetative communities.

A. ALTERNATIVES ELIMINATED FROM DETAILED STUDY

The need to develop a no herbicide alternative to address public health concerns was considered but not developed in detail. Syracuse Environmental Research Associates, Inc. prepared a Risk Assessment for triclopyr, imazapyr, glyphosate, and imazapic (Syracuse Environmental Research Associates, Inc. 2011, 2011b, 2011c, 2004). Typical exposures to these chemicals do not lead to estimated doses that exceed a level of concern for either workers or members of the general public at the typical application rate. Therefore, this alternative was not developed in detail.

During the 3 ½ year injunction banning the use of herbicides on the Ozark-St. Francis National Forests, costs of reforestation and timber stand improvement increased considerably (Ebling, Smith; 1982). Areas treated without herbicides required additional treatments or follow-up application to complete the treatment resulting in additional costs. There is no other effective non-herbicide treatment to control fescue and Bermuda grass in wildlife openings. Treatments without herbicide would be ineffective, costly, and would not meet the purpose and need for providing quality wildlife habitat.

B. DETAILED DESCRIPTION OF ALTERNATIVE 1 (PROPOSED ACTION ALTERNATIVE)

A summary table (Table 2) showing the following actions is shown beginning on page 15. The Harvest Plan Map is shown on page 19, the Silvicultural Treatment Map is shown on page 21, the Wildlife Habitat Improvement Map is shown on page 23, and the Road Management Map is shown on page 25.

Compartment 1/Stands 22 and 23; Compartment 14/Stands 16 and 22; and Compartment 55/Stands 8, 12, and 16 would be regenerated using the pine shelterwood method of cutting. Approximately 20-30 pine seedtrees would be left per acre. Additionally, leave den trees and mast-producing hardwood at a rate of approximately 10-20 trees per acre where available. Shelterwood cutting is proposed for approximately 378 acres.

After harvesting and to facilitate site preparation, firewood removal would be evaluated with reference to demand and availability. If areas are set up for firewood removal, firewood would be removed through firewood permits. Mast producing trees 8.0" diameter or larger at 4.5' height would not be cut for firewood unless they are approved by a wildlife biologist or technician. This would be done only to improve mast production on an adjacent tree.

Site preparation of the above stands would be accomplished by selective directed foliar application and/or hand tool injection with herbicides. Directed foliar application would be done with a mixture of triclopyr ester (up to 1.0 lb. of active ingredient/acre) and imazapyr (up to 0.1 lb. of active ingredient/acre). Hand tool injection would be done with an application of a mixture of triclopyr amine (up to 1.0 lb. of active ingredient/acre) and imazapyr (up to 0.1 lb. of active ingredient/acre). The directed foliar application would be used on vegetation up to six feet in height. Hand tool injection would be used on selected hardwood trees above 1" in diameter at 4.5' height. Mast producing trees 8.0" diameter or larger at 4.5' height above ground level would not be treated during site preparation unless otherwise approved by a wildlife biologist or technician. See Mitigation Measure #22 for a list of species that would not be treated regardless of size.

Foliar spray would occur between May and October with May, June, September, and October being the optimum period. Injection treatments would occur between May and October with July-August being the optimum period. See Mitigation Measures #23-36 for specific mitigation for site preparation.

Site Prep burning would be done if needed to provide an adequate seedbed in the shelterwood stands. The stands would be evaluated after the chemical treatment has had time to be effective to see if this prescribed burning is necessary. If needed, burning would be thirty or more days following chemical treatment and timed to occur prior to seedfall in the fall season when residual trees would be least susceptible to fire damage.

Planting of shortleaf pine in these stands would be done if natural seedfall does not regenerate these sites. Stocking evaluations would be done one to three years after site preparation to determine stocking. If a stand is not adequately stocked, planting would be done the following winter.

Once pine seedlings are established and a release treatment is deemed necessary, the above stands would be released from competition. Release would be accomplished by directed foliar application and cut surface treatment. Directed foliar application would be done with a mixture of triclopyr ester (up to 1.0 lb. of active ingredient/acre) and imazapyr (up to 0.1 lb. of active ingredient/acre). Cut surface treatment would be done with an application of a mixture of triclopyr amine (up to 1.0 lb. of active ingredient/acre) and imazapyr (up to 0.1 lb. of active ingredient/acre). These treatments would be applied within a four-foot radius of the selected pine leave tree to be released on an 8' x 8' spacing. Foliar spray would occur between May and October with May, June, September, and October being the optimum period. Injection treatments would occur between May and October with July-August being the optimum period. Refer to Mitigation Measures #23-36 for specific mitigation for release.

All of the above stands would be evaluated for seedtree removal after the stands are certified as being adequately stocked with the desired regeneration. Total potential for seedtree removal would be approximately 378 acres. Hardwoods protected during the seedtree cut would be protected during the seedtree removal cut as well.

Compartment 14/Stand 24 and Compartment 55/Stand 18 are existing shortleaf pine seedling/sapling stands with the seedtrees still in place. These stands contain an adequate stocking of seedling/saplings and the seedtrees are no longer needed to provide regeneration. These stands are proposed for seedtree removal and total approximately 79 acres.

Non-native invasive plant species would be treated on up to approximately 700 acres per year within the boundaries of Compartments 1, 14, 55, and 56. Species treated could include but is not limited to Tree-of-Heaven, paulownia, mimosa, privet, Sericea lespedeza, kudzu, fescue, etc. This would include any species from the Regional Forester's List of Invasive Exotic Plant Species of Management Concern. Some sites of privet have already been noted within the project area. This would be for future treatment of infestation as sites are identified. Herbicide treatment would be done according to label directions for the target species using triclopyr amine, glyphosate, and/or imazapyr or a combination of these chemicals. Treatment would be done through foliar spraying or stump treatment directly on the target plant. Up to 0.3 lb. of active ingredient per acre of imazapyr, up to 8 oz. of imazapic per acre, up to 1.0 lbs. per acre of triclopyr amine, and up to 2.0 lbs. of active ingredient per acre of glyphosate (1.5 lbs. active acid equivalent) would be applied.

Compartment 14/Stands 1, 7, 10, 14, 15, 19, 20, 21 and Compartment 56/Stands 1, 2, 3, 5, 7, 9, 10, 11, 12, and 15 would be thinned to a basal area of approximately 50 ft^2/acre. These stands are proposed for shortleaf pine/loblolly pine thinning and total approximately 1,215 acres.

Compartment 1/Stands 1, 3, 4, 5, 6, 8, 9, 17, 20 and Compartment 55/Stands 1, 2, 3, 4, 5, 6, 7, 9, 11, 14, 15, 17, and 23 would be thinned to a basal area of approximately 60 ft^2 /acre. These stands would have both pine and hardwood thinned and total approximately 1,424 acres.

Compartment 1/Stand 13 and Compartment 56/Stands 4 and 6 would be thinned to a basal area of approximately 70 ft^2 /acre. This stand would have both pine and hardwood thinned and total approximately 54 acres.

Compartment 1/Stands 10, 11, 12, and a portion of stands 9, 13 and 19 require the ability to conduct a salvage/sanitation thinning when trees die or are blown down during wind events. This thinning is necessary for the efficient removal of trees that potentially impact the safety of visitors to a developed recreation site, stop possible insect spread on weakened trees, or provide for public utilization of downed timber. Both pines and hardwoods would be subject for removal under these circumstances.

Project acres outside those mentioned above require the ability to harvest damaged timber resulting from ice storms, wind events, insect infestations or diseases. Both pines and hardwoods would be subject for removal under these circumstances.

Cedar would be harvested or cut and left when management activities are conducted in Compartments 1, 14, 55, and 56 totaling approximately 4516 acres. Estimate a maximum 450 acres treated per year.

Road activities proposed include approximately 15.7 miles of temporary road construction, 0.6 miles of road

construction, 11.0 miles of road reconstruction, 5.2 miles of road decommissioning, 4.2 miles of road maintenance, and removal of two road closures. Individual road numbers are listed in Table 2. Locations of these road activities are shown on the Roads Management Map for Alternative 1 with the exception of temporary road locations. Maps of these road locations are located in the process file.

Eight wildlife openings are proposed for construction located in Compartment 1/Stand 18; Compartment 14/Stands 1, 7, 24, 25, and Compartment 56/Stand 12. Construction would consist of removing the timber on these openings by harvesting during the timber sale or by permit at time of opening construction. These openings would be constructed up to five acres in size. Stumps would be mechanically removed during construction and openings would then receive disking, fertilizing, liming, and seeding with grass seed suitable for wildlife. Routine restoration would then be performed by brushhogging the openings followed by a chemical treatment with imazapyr, imazapic, triclopyr amine, and/or glyphosate, if needed, to eradicate non-native species and woody species. Each opening would be evaluated before treatment to determine which chemical(s) would be used. Chemical application would occur between March and October using a tractor-mounted sprayer. This would be followed by liming, disking, and planting seed suitable for wildlife on each opening. These openings are proposed for three restoration treatments on a two-year interval. Up to 0.3 lb. of active ingredient per acre of imazapyr, up to 8 oz. of imazapic per acre, up to 1.0 lbs. per acre of triclopyr amine, and up to 2.0 lbs. of active ingredient per acre of glyphosate (1.5 lbs. active acid equivalent) would be applied during mechanical liquid applications. These openings are proposed for two restoration treatments after construction on two-year intervals. Access roads into these openings would be blocked after the openings are constructed.

Three existing wildlife openings are proposed for restoration located in Compartment 1/Stands 4, 17; and Compartment 55/Stand 5. Restoration would be done as described above.

Wildlife stand improvement (WSI) would be done in Compartment 1/Stands 15, 16, 18, and 19, Compartment 14/Stands 2, 4, 6, 11, 12, 13 and 17, and Compartment 56/Stands 8, 13 and 14 totaling approximately 557 acres. WSI would be done using hand tools and chemical within a six-foot radius of the selected hardwood leave tree. Hardwood leave trees would be chosen on a 12' x 12' spacing. Vegetation within the six-foot circle would be chainsawed and the stumps treated with a mixture of triclopyr amine and imazapyr. Cut surface treatment would be done with an application of a mixture of triclopyr amine (up to 1.0 lb. of active ingredient/acre) and imazapyr (up to 0.1 lb. of active ingredient/acre). All eastern red cedar, regardless of size, would be cut but would not be treated with chemical.

Riparian Stand Improvement (RSI) – The Forest Plan calls for using a Silvicultural Prescription of 106 for our Riparian Corridors. Riparian stand improvement is similar to WSI only species retention would be different in the riparian areas. It would be cutting to a basal area of between 60 to 80 BA with most areas closer to 60 BA. Trees would be cut and left on the flood plain to improve riparian conditions. When cutting the trees there would be a focus on removal of pine and cedar from the riparian area because they did not naturally exist in high numbers in the flood plain. There would be a focus on leaving hickory (especially shagbark for bats), walnut, and oaks for wildlife so these species should be the tree species that are kept most often. The second focus would be on keeping other riparian dependent species like sycamore, birch, ash, and sweet gum. Trees within 20 feet of the bank of the stream would not be cut as stated in Forest standard FW81. .

Linear Food Plots would be created in Compartment 14/Stand1and Compartment 55/Stands 4, 14, 15, 16, and 17. These linear openings would be created on roads FDR 1632B, 1639 and 96014B. Areas designated as linear wildlife openings would be disked, fertilized, limed and seeded with grass seed suitable for wildlife.

Wildlife habitat improvement and fuels reduction prescribed burning is proposed for all compartment acres in Compartments 1, 14, 55 and 56 (4516 acres). First planned burning rotation would include all stands. Burning during the second rotation would exclude 378 acres in Compartment 1/Stands 22, 23; Compartment 14/Stands 16, 22 and Compartment 55/Stands 8, 12 and 16. Subsequent rotations would include all compartment acres (4516 acres). Wildlife habitat improvement and fuels reduction burning is proposed for four treatments on a three to four year rotation. See Mitigation Measures #38-43 for specific mitigation relating to prescribed burning.

Lake habitat improvement is proposed for Spring Lake. Up to 50 fish structures would be placed in Spring Lake in an effort to provide additional habitat and spawning areas for fish. To promote lake health, aquatic

herbicide application to control aquatic vegetation, liming, and fertilization of the lake would take place. In addition, construction of a handicap accessible fishing pier at each boat ramp and any needed boat ramp maintenance, is proposed as part of the Prairie Project.

Stream habitat management is proposed on approximately 13.0 miles of streams in the project area. The Wildlife Habitat Improvement Map shows the locations of this treatment and Table 2 lists the individual stands. Large wood (LWD) would be felled or placed in the streambed. Wood would consist of trees over 16.4 feet long and greater than 19.7 inches in diameter. Anywhere from 8-20 trees per mile would be placed in the streams.

Two aquatic organism passages would be installed on two different road/stream locations. Both locations are in Compartment 14/Stands 3 and 12. These crossings would be replaced with structures that are equal in width to the stream channel with as big of an opening as possible and would be either bottomless or if the structure has a bottom then the structure would be counter sunk into the stream bottom. The crossings would be replaced as funding becomes available. See Wildlife Habitat Improvement Map for approximate locations.

Approximately 3.4 miles of OHV trail would be added within the project area on FDR 1632, 1632C and 96001F.

Close FDR 96001E after timber harvest. Road closure would involve either a gate or earthen mound.

Table 2: Summary of Alternative 1 Actions [1]

SHORTLEAF PINE SHELTERWOOD HARVESTING	**378 Acres** 7233 CCF *C-1/Stands 22 and 23* *C-14/Stands 16 and 22* *C-55/Stands 8, 12, and 16*
SHORTLEAF PINE SITE PREPARATION Handtools/Chemical/Prescribed Burning	**378 Acres** *C-1/Stands 22 and 23* *C-14/Stands 16 and 22* *C-55/Stands 8, 12, and 16*
SHORTLEAF PINE PLANTING Handtools	**378 Acres** *C-1/Stands 22 and 23* *C-14/Stands 16 and 22* *C-55/Stands 8, 12, and 16*
SHORTLEAF PINE RELEASE Handtools/Chemical	**633 Acres** *C-1/Stands 7, 22, and 23* *C-14/Stands 16, 22, and 24* *C-55/Stands 8, 10, 12, 13, 16, and 18*
SHORTLEAF PINE/LOBLOLLY PINE THINNING	**2683 Acres** 29,850 CCF *Thin to 50 BA* *C-14/Stands 1, 7, 10, 14, 15, 19, 20, and 21* *C-56/Stands 1, 2, 3, 5, 7, 9, 10, 11, 12, and 15* *Thin to 60 BA* *C-1/Stands 1, 3, 4, 5, 6, 8, part of 9, 17, and 20* *C-55/Stands 1, 2, 3, 4, 5, 6, 7, 9, 11, 14, 15, 17, and 23* *Thin to 70 BA* *C-1/Stand 13* *C-56/Stands 4 and 6*
CEDAR THINNING	**4,516 Acres** Up to 450 acres per year *C-1/All Stands* *C-14/All Stands* *C-55/All Stands* *C-56/All Stands*
SHORTLEAF PINE SEEDTREE REMOVAL	**457 Acres** 4194 CCF *C-1/Stands 22 and 23* *C-14/Stand 16, 22 and 24* *C-55/Stand 8, 12, 16 and 18*

[1] All acres, miles, and volumes are approximations

***Table 2. Summary of Alternative 1 Actions, continued*[1]**

TEMPORARY ROAD CONSTRUCTION	**15.7 Miles** *C-1, 14, 55, 56*
ROAD CONSTRUCTION	**0.6 Miles** *FDR 96001E*
ROAD RECONSTRUCTION	**11.0 Miles** *Portions of FDR 1625, 1632, 1632C, 1640, 1640A, 96014B, and Spring Lake Road (1602)*
ROAD DECOMMISSIONING	**5.2 Miles** *Portions of FDR 1625A, 1632A, 1632B, 1639, 96014A, 96014B, 96055D, 96055F and 96055G*
ROAD MAINTENANCE	**4.2 Miles** *Portions of FDR 1618A, 1632C, 1639, and 96001C*
NON-NATIVE INVASIVE SPECIES TREATMENT Handtools/Chemical	**Up to 700 acres/year** *C-1/All Stands* *C-14/All Stands* *C-55/All Stands* *C-56/All Stands*
WILDLIFE OPENING CONSTRUCTION/RESTORATION[2]	**8 Openings** *C-1/Stand 18* *C-14/Stands 1, 7, 8, and 25* *C-55/Stand 15* *C-56/Stand 12 (2x)*
WILDLIFE OPENING RESTORATION[3]	**3 Openings** *C-1/Stands 4, 17* *C-55/Stand 5*
WILDLIFE STAND IMPROVEMENT/ RIPARIAN STAND IMPROVEMENT	**557 Acres** *C-1/Stands 15, 16, 18, and 19* *C-14/Stands 2, 4, 6, 11, 12, 13, and 17* *C-56/Stands 8, 13, and 14*
LINEAR FOOD PLOT	**4.0 Acres** *FDRs 1632B, 1639, and 96014B*

[1] Acres and miles are approximations
[2] Proposed for three restoration treatments on a two-year rotation
[3] Proposed for two additional follow-up restoration treatments on a two-year rotation.

***Table 2. Summary of Alternative 1 Actions, continued*[1]**

STREAM HABITAT IMPROVEMENT	**(13 Miles)** C1/Stands 1, 2, 3, 9, 10, 11, 12, 13, 15, 16, 18, 22, and 23 C14/Stands 1, 2, 3, 5, 6, 8, 11, 12, 13, 14, 15, 16, and 17 C55/Stands 4, 6, 7, and 16 C56/Stands 2, 8, 12, and 13
AQUATIC ORGANISM PASSAGE CONSTRUCTION	**2 Passages** *C-14/Stands 3 and 12*
LAKE HABITAT IMPROVEMENT-FISH STRUCTURES	**Up to 50 in Spring Lake**
OHV TRAIL ADDITION	**3.4 Miles** *FDR 1632, 1632C, and 96001F*
WILDLIFE HABITAT IMPROVEMENT/ FUELS REDUCTION PRESCRIBED BURNING[2]	**4514 Acres** *C-1/All Stands* *C-14/All Stands except 18*[3] *if possible.* *C-55/All Stands* *C-56/All Stands* *The following 378 acres would be excluded during the first burning rotation after harvest but are expected to be planned for burning in subsequent rotations* *C-1/Stands 22 and 23* *C-14/Stands 16 and 22* *C-55/Stands 8, 12, and 16*
SALVAGE AROUND SPRING LAKE	**173 Acres** C-1/Stands 10, 11 and 12 C-1/Portions of stands 9, 13, and 19
SALVAGE ACROSS THE PROJECT AREA	**4343 Acres** All acres in the Project Area except those within the Spring Lake salvage acres.

[1] Acres and miles are approximations
[2] Proposed for three treatments for burning on a three to four-year rotation
[3] C14/Stand 18 is covered for burning in the event of unintended ignition. Research scientists prefer that no management activities take place within this stand if possible.

Map 2: Harvest Plan Map

Map 3: Silvicultural Treatment Map

Map 4: Wildlife Habitat Improvement Map

Map 5: Road Management Map

C. DESCRIPTION OF ALTERNATIVE 2 (NO ACTION ALTERNATIVE)

This alternative would not implement any part of the Proposed Action. Only ongoing Forest Service permitted and approved activities would continue.

D. MITIGATION MEASURES

For each alternative, all applicable standards in the Ozark-St. Francis NFs RLRMP would be applied. The following standards and guidelines are incorporated by reference in this EA:

RLRMP -- pages 3-1 to 3-21 (Forest-Wide Standards), page 3-31 (Management Area 2.C – Developed Recreation Areas), page 3-35 (Management Area 3.A – Pine Woodland), page 3-35 (Management Area 3.C – Mixed Forest), and page 3-37 (Management Area 3.I – Riparian Corridors).

Best Management Practices (BMP) Guidelines for Water Quality Protection (Arkansas Forestry Commission, 2002) and selected Region 8 Timber Sale AT, BT, and CT Clauses would also apply as standard mitigation measures for all proposed actions.

Appropriate mitigation measures from the Scenery Management Guide – Southern Regional National Forests, April 2008 (U.S. Department of Agriculture - Forest Service, 2008) would apply as standard mitigation measures.

Some of the more important of these mitigation measures and standards and guidelines are summarized below along with specific mitigation measures for this project. This list is not all-inclusive. The above documents should be referenced for a complete list.

1) Logging slash would be placed above the ordinary high water mark of any stream (Arkansas Forestry Commission BMP).

2) Concurrent with temporary road construction, install silt barriers at the base of the cut and fill slopes within 50 feet of a stream course (RLRMP, p. 3-11).

3) At stream crossings, seed and mulch cut and fill slopes within 50 feet slope distance within 5 days after construction of temporary roads (RLRMP, p. 3-11).

4) Apply gravel at temporary road crossings for 35 feet on both sides of the stream channel, when the risk of soil erosion is present and where the crossing substrate requires hardening (RLRMP, p. 3-11).

5) Stream crossings that will be utilized on a regular basis would be improved with oversized rock to help prevent rutting in the channels.

6) On temporary roads, apply gravel on steep grades exceeding 10 percent slope (RLRMP, p. 3-11).

7) Soil disturbances within streamside management zones (SMZs) would be treated with erosion control measures within five days (RLRMP, p. 3-11).

8) Streamside management zones (SMZs) would be identified and designated during the appropriate stages of project planning for all defined channels, perennial streams, and springs. Minimum SMZs would be as described below based on the percent of the adjacent slope (RLRMP, p. 3-12):

Stream Type	Slope Adjacent to the Channel		
	0-15%	16-35%	36%+
Description	Horizontal Distance from Both Sides of Stream Bank or Lake/Pond		
Perennial & Springs	100’	125’	150’
Defined Channels	50’	75’	100’

- Vegetation within 20 feet of the bank of a perennial stream and 5 feet of a defined channel would not be removed.
- Retain at least 50 square feet per acre of basal area within the SMZs when available.
- No mechanical site preparation is allowed within the SMZs.
- Within SMZs, only non-motorized trails are allowed. Motorized trails are prohibited except at designated crossings or where the trail location requires some encroachment for safety.
- No more than five percent of the mineral soil within the SMZs would be exposed during ground disturbing activities.
- Exceptions to SMZ standards are only allowed after site-specific determinations and with consultation/approval by the appropriate Staff Officer (RLRMP, p. 3-12).

9) On all soils dedicated to growing vegetation, the organic layers, topsoil, and root mat would be left intact over at least 85 percent of an activity area (RLRMP, p. 3-12).

10) Removal of natural debris from streams would only be allowed where it poses a significant risk to public safety or threatens private property or Forest Service infrastructure (RLRMP, p. 3-12).

11) Within the SMZs, cross only at designated crossings identified during planned activities. Cross at a 90-degree angle and utilize temporary structures to maintain bank stability (RLRMP, p. 3-13).

12) When temporary culverts or other approved structures are used, they must be removed upon completion of the activity. Streamside management zones disturbances would be restored to a stable, natural condition (RLRMP, p. 3-13).

13) Soil and debris would not be deposited in wetlands, springs, or seeps (RLRMP, p. 3-13).

14) Logging and roadwork would be restricted during wet soil conditions to minimize resource damage.

15) During harvesting, signs would be posted to caution users of FDR 1602 (Spring Lake Road).

16) Logging slash would not be left over two feet high within 50 feet of FDR 1602 (Spring Lake Road). Slash within these zones would both be lopped within 2 feet of the ground and scattered or slash would be dragged out of this zone. Broken trees and leaners within these zones would be dropped to lessen their disturbance.

17) Apply the following standards to harvest activities along the interior paved road on the south (left) side in Compartment 1 Stand 13 and along the east and south (left) side of the paved roads in Compartment 1 Stand 9:

    A 100-foot buffer of thinning will be implemented in harvest areas. This buffer will be thinned to a basal area of no less than 70 ft^2 per acre.

    Slash within these 100-foot buffers would be dragged for 50 ft.away from the road, lopped, and scattered to a height of 2 ft. or less for an additional 50 ft.

    The 100-foot buffer along the interior/paved road will be flagged by the marking crew foreman before the sale is marked.

    The buffer flagging will be rechecked along paved roads by the Contracting Officer's Representative (COR) before silvicultural contracts are started.

    Marking paint will be applied to the backside of trees to be cut within 50 feet of paved road edge.

    Harvest activities along the paved road within the developed recreation area will take place only during the closed season which is the day after Labor Day to Memorial Day weekend.

    All harvest activities and slash removal within the 100-foot buffer will be completed at least two weeks before the recreation area is opened for Memorial Day weekend.

18) Protect the visual resource by stand shaping and irregular boundaries in the proposed shelterwood

stands as needed to achieve the visual quality objective. Take advantage of any opportunities to leave groups of hardwoods in pine regeneration areas.

19) Heritage sites that are determined eligible for the National Register and sites that have undetermined eligibility would be protected from any ground-disturbing activities associated with this project. Buffers would be painted around these sites, and heavy machinery would not be allowed within these boundaries. If additional sites are found during implementation of this project, they would be examined and necessary mitigation measures prescribed by the Forest or District Archaeologist, in consultation with the Arkansas SHPO and relevant federally recognized Tribes, would be implemented.

    Sites that have been determined not eligible for nomination to the National Register would not be protected unless there is a safety concern or traditional cultural practice associated with the site.

20) A review of listings and locations of all known occurrences of proposed, endangered, threatened, or sensitive species (PETS) has been conducted. In addition, field surveys have been made on all stands to be impacted by each of the action alternatives. No critical or essential habitat for any PETS species was identified in these compartments. If any additional PETS species are discovered prior to or during implementation, the project would be halted and a new biological evaluation would be made to determine the effects on the species and its habitat. A Biological Evaluation was prepared for this project and is part of the process file.

    Timber harvest activities would leave, on average, a minimum of six roost trees, snags, or potential roost trees per acre as per the 1998 U.S. Fish and Wildlife Service Biological Opinion for the Indiana Bat (U.S. Fish and Wildlife Service, 1998).

    Maintain the following average standing dead, existing, and potential hollow den and loose bark trees per acre forest wide:

    2 snags per acre greater than 12” dbh; plus
    4 snags per acre
    Total 6 snags per acre

    Snags would be left from the largest size classes and maybe clumped (RLRMP, p. 3-6).

    If Ozark chinquapin were located in a stand to be treated with herbicide, the trees would be placed in a 60-foot buffer, inside which no treatment with herbicides or hand tools would occur.

21) Mast producing trees 8.0" diameter or larger at 4.5' height above ground level would not be treated during site preparation unless otherwise approved by a wildlife biologist or technician.

22) Exclude herbicide application from designated hardwood key areas.

    The following trees, shrubs, and plants - regardless of size and of treatment method - would not be treated during site preparation or release: black cherry, dogwood, French mulberry, persimmon, serviceberry, plum, and Ozark chinquapin.

23) During site preparation and release, treatments with hand tools and/or herbicide would not be done within 100 feet of private land.

24) Herbicides and application methods are chosen to minimize risk to human and wildlife health and the environment. Diesel oil would not be used as a carrier for herbicides, except as it may be a component of a formulated product when purchased from the manufacturer. Vegetable oils would be used as a carrier for herbicides when available and compatible with the application proposed (RLRMP, p. 3-4).

25) Herbicides are applied at the lowest rate effective in meeting project objectives and according to guidelines for protecting human and wildlife health. Application rate and work time must not exceed levels that pose an unacceptable level of risk to human or wildlife health. If the rate or exposure time being evaluated causes the Margin of Safety or the Hazard Quotient (HQ) computed for a proposed treatment to fail to achieve the current Forest Service Region 8 standard for acceptability (acceptability requires a MOS > 100 or, using the Syracuse Environmental Research Associates (SERA) Risk

Assessments found on the Forest Service website, a HQ of < 1.0), additional risk management must be undertaken to reduce unacceptable risks to acceptable levels or an alternative method of treatment must be used (RLRMP, p. 3-4).

26) Fuelwood sales would not be made for a minimum of 30 days after treatment in areas where pesticide treatments have been made. Should injection of trees be done, effected trees would not be sold as fuelwood (RLRMP, p. 3-4).

27) Weather is monitored and the project is suspended if temperature, humidity, and/or wind are in excess of the criteria shown below (RLRMP, p. 3-4).

Application Techniques	Temperatures Higher Than	Humidity Less Than	Wind (at Target) Greater Than
Ground			
Hand (cut surface)	NA	NA	NA
Hand (other)	98°	20%	15 mph
Mechanical (liquid)	95°	30%	10 mph

28) Each COR, who must ensure compliance on contracted herbicide projects, is a certified pesticide applicator (RLRMP, p. 3-5).

29) A certified pesticide applicator supervises each Forest Service application crew and trains crew members in personal safety, proper handling and application of herbicides, and proper disposal of empty containers (RLRMP, p. 3-5).

30) With the exception of treatment by permittees of right-of-way corridors that are continuous into or out of private lands and through Forest Service managed areas, no herbicide is broadcast within 100 feet of private land or 300 feet of a private residence unless the landowner agrees to closer treatment. Buffers are clearly marked before treatment so applicators can easily see and avoid them (RLRMP, p. 3-5).

31) Application equipment, empty herbicide containers, clothes worn during treatment, and skin are not cleaned in open water or wells. Mixing and cleaning water must come from a public water supply and be transported in separate labeled containers. (RLRMP, p. 3-5).

32) Herbicide mixing, loading, or cleaning areas in the field are not located within 300 feet of private lands, open water or wells, or other sensitive areas (RLRMP, p. 3-5).

33) Herbicide would not be used within the appropriate SMZs or within 300 feet of any public or domestic water intake. Selective treatments may occur within SMZs only when a site-specific analysis of actions to prevent significant environmental damage such as noxious weed infestations supports a "Finding of No Significant Impact" (FONSI), and then using only herbicides labeled for both terrestrial and aquatic use within these areas (RLRMP, p. 3-5).

34) The risk of herbicide spills would be reduced by securing containers during transport, carrying only enough for a day's work, mixing and cleaning on the work site, proper disposal of containers and preparation of an emergency spill plan (U.S. Department of Agriculture – Forest Service, 1981). This spill plan is part of the process file.

35) Edible berries would not be treated with herbicide.

36) Herbicide application would be suspended by the COR or inspector if rainfall is heavy enough to cause movement of herbicide from target species.

37) Best available smoke management practices (FSM 5140, Arkansas Smoke Management Guidelines, and State Implementation Plans) would be used to minimize the adverse effects of prescribed burning on public health and safety and to protect visibility in Class I Area (Upper Buffalo Wilderness) (RLRMP, p. 3-13).

38) Prescribed burning would be conducted in, or adjacent to, counties with forecasted high Air Quality Index (AQI) values (AQI equals orange or higher) only if meteorological conditions indicate that smoke would be carried away from the high AQI area (RLRMP, p. 3-13).

39) Conduct all National Forest management activities in a manner that does not result in (1) a significant contribution to a violation of National Ambient Air Quality Standards or (2) a violation of applicable provisions in the State Implementation Plan (RLRMP, p. 3-13).

40) Herbicide treatment areas would not be prescribed burned for at least 30 days after application (RLRMP, p. 3-20).

41) In any prescribed burning, the duff layer would remain present on 80 percent of the burn area (RLRMP, p. 3-20).

42) Appropriate erosion control strategies would be applied to fire lines in order to minimize soil erosion (RLRMP, p. 3-20).

43) If necessary to cross a stream with a fireline, the crossings would be as close to right angles as possible and be stabilized as soon after the fire is controlled as possible (RLRMP, p. 3-20).

44) Historic Properties (HP)1: Site Avoidance During Project Implementation

    Avoidance of historic properties will require the protection from effects resulting from the undertaking. Mitigation measures include establishing clearly defined site boundaries and buffers around archeological sites where activities that might result in an adverse effect and routing proposed new roads, temporary roads, log landings, and skid trails away from historic properties. Buffers will be of sufficient size to ensure that site integrity is not compromised.

45) HP2: Site Protection During Prescribed Burns

    (1) Firelines: Historic properties located along existing non-maintained woods roads used as fire lines will be protected by hand-clearing those sections that cross the sites. Although these roads are generally cleared of combustible debris using a small dozer, those sections crossing archeological sites will be cleared using leaf blowers and/or leaf rakes. There will be neither removal of soil, nor disturbance below the ground surface, during fireline preparation. Historic properties and features located along proposed routes of mechanically-constructed firelines, where firelines do not now exist, will be avoided by routing fireline construction around historic properties. Sites that lie along previously constructed dozer lines from past burns (where the firelines will be used again as firelines) will be protected during future burns by hand clearing sections of line that cross the site, rather than re-clearing using heavy equipment. Where these activities will take place outside stands not already surveyed, cultural resource surveys and consultation will be completed prior to project implementation. Protection measures HP1, HP3, and HP4 will be applied prior to project implementation to protect historic properties.

    (2) Burn Unit Interior: Combustible elements at historic properties in burn unit interiors will be protected from damage during burns by removing excessive fuels from the feature vicinity and, where applicable, by burning out around the feature prior to igniting the main burn and creating a fuel-free zone. Historic properties containing above ground, non-combustible cultural features and exposed artifacts will be protected by removing fuel concentrations dense enough to significantly alter the characteristics of those cultural resources. For sites that have been previously burned or that do not contain combustible elements or other above-ground features and exposed artifacts, no additional measures are proposed. Past research indicates that prescribed burning will not be sufficiently intense to cause adverse effects to these features.

    (3) Post-Burn Monitoring: Post-burn monitoring may be conducted at selected sites to assess actual and indirect effects of the burns on the sites against the expected effects. State Historic Preservation Office (SHPO) consultation will be carried out with respect to necessary mitigation for any sites that suffer unexpected damage during the burn or from indirect effects following the burn.

46) HP3: Other Protection Measures

If it is not feasible or desirable to avoid a historic property that may be harmed by a project activity (HP1), then the following steps will be taken:

(1) In consultation with the Arkansas SHPO, the site(s) will be evaluated against National Register of Historic Places (NRHP) significance criteria (36 CFR 60.4) to determine eligibility for the NRHP. The evaluation may require subsurface site testing;

(2) In consultation with the Arkansas SHPO, relevant federally-recognized Tribes, and if required with the Advisory Council on Historic Preservation (ACHP), mitigation measures will be developed to minimize the adverse effects on the site, so that a finding of No Adverse Effect results;

(3) The agreed-upon mitigation measures will be implemented prior to initiation of activities having the potential to affect the site.

47) HP4: Discovery of Cultural Resources during Project Implementation

Although cultural resources surveys were designed to locate all NRHP eligible archeological sites and components, these may go undetected for a variety of reasons. Should unrecorded cultural resources be discovered, activities that may be affecting that resource will halt immediately; the resource will be evaluated by an archaeologist, and consultation will be initiated with the SHPO, tribes and nations, and the ACHP, to determine appropriate actions for protecting the resource and mitigating adverse effects. Project activities at that locale will not resume until the resource is adequately protected and until agreed-upon mitigation measures are implemented with SHPO approval.

Monitoring

Implementation monitoring would be accomplished through harvest and contract inspections conducted by certified timber sale administrators and contract inspectors. This would ensure the appropriate standards and guidelines would be implemented to protect soil productivity, water quality and other resources.

For Alternative 1, surveillance monitoring to ensure that herbicide label instructions are being followed would be conducted as part of contract administration. To monitor the offsite movement of herbicides, water samples would be collected and analyzed on 10% of the district's project per year in accordance with the Ozark-St. Francis National Forest's Herbicide Monitoring Plan for Water Quality.

Survival monitoring would be done to determine success of reforestation efforts in regeneration areas.

Monitoring of prescribed burns would be done in accordance to prescribed burning plans. Results of the burns would be monitored and documented.

Those areas that are proposed to have timber harvest and/or prescribed burning would have an additional post-treatment walkover for heritage resource examination. Post treatment walkover would be conducted according to the direct gradient method that has been found highly successful in site discovery (Collins and Bousman 1993, Lockhart, et al., 1995). Landforms that appear to have intact soils and high potential for human use or occupation (e.g. benches, river flats and slopes and floodplain terraces) would be given special attention in an effort to maximize the potential of finding as many sites as possible.

E. COMPARISON OF ALTERNATIVES

This section provides a summary of the effects of implementing each alternative. Information in Table 3 is focused on activities and effects where different levels of effects or outputs can be distinguished quantitatively among alternatives.

Table 3: Comparison of Effects Summary Matrix[1]

ACTION	ALTERNATIVE 1	ALTERNATIVE 2
SOIL AND WATER IMPACTS		
Disturbance Acres (skid trails, temporary road construction, road reconstruction, fireline construction)	481 acres	----
% of Total Activity Area	11%	----
Spring Creek Watersheds[2]		
Concern Level	Moderate	Moderate
Upper Chickalah Creek Watersheds		
Concern Level	Low	Low
Prairie Creek Watersheds		
Concern Level	Moderate	Moderate
ECONOMICS		
Present Value Revenues	$ 1,263,881	$ 0
Present Value Costs	$ 861,780	----
Net Present Value	$ 402,101	$ 0
Benefit/Cost Ratio	1.47	----

[1] All measures are approximations.
[2] Based on worst case scenario, all management activities would occur within the same year. This is highly unlikely to occur.

III. ENVIRONMENTAL CONSEQUENCES

This section summarizes the physical, biological, social, and economic environments of the affected project area and the potential changes to those environments due to implementation of the alternatives.

A. SOILS

Existing Condition

The analysis area (Compartments 1, 14, 55, and 56) for soils consists mostly of broad gently sloping ridge tops separated by sloping to moderately steep side slopes and narrow stream valleys. Soils are stable throughout the project area. About 77% of the project area is on slopes less than 8%, 7% is on slopes between 8 and 20% and the remainder is steeper than 20%. Part of the project area was harvested in 1990 and in 1995. Transects were done through some of the previously harvested stands to determine the condition of the soil. Soil disturbance from the harvests conducted in 1990 and 1995 has mostly recovered. Soils are covered by litter and duff, surface stones, understory forbs, vines, understory shrubs, midstory pines and hardwoods, and over story shortleaf pines. Soils have good structure and surface soils are friable. There are some short rutted sections ranging from 25 to 100 feet long in the shallow Mountainburg soils around the perimeter of the seed tree in stand 18 compartment 55. Soils are mostly well drained and range from shallow to deep. There are some deep well drained soils on the floodplains and terraces along Spring Creek, Dooley Branch, and Prairie Creek which have small inclusions of poorly drained hydric soils in depressions. There are some moderately well drained soils on the floodplains along Box Spring Branch and the upper reaches of Haags Hollow, which have small inclusions of poorly drained hydric soils in depressions. Appendix B, page 111, contains a map showing the soil types for these compartments.

The potential disturbance for the soil resource was estimated using coefficients developed from soil disturbance monitoring done on the Ozark-St. Francis National Forests during 1993-2007. Estimates of temporary loss of soil productivity assumes that all of the proposed activities would occur within one year. This is a worst-case assumption, which is highly unlikely to occur, but it demonstrates the maximum potential soil productivity loss for the project area. Recovery from the temporary loss in soil productivity is expected to occur within 20 to 25 years based monitoring done on the Magazine Ranger District in 1981 and 2001. Recovery from soil disturbance may occur as soon as 18 years based on the observations made in stands in this project area that were harvested in 1995.

Effects

Alternative 1

Approximately 11 percent (481 acres) of the harvested area would sustain a temporary reduction in soil productivity due to harvesting operations. An additional 27 acres (<1% of the harvest area) would sustain a temporary reduction in soil productivity due to temporary road construction. Soil productivity would be lost on approximately 6 acres due to road construction, reconstruction and realignment because soil will be taken out of production permanently and dedicated to use as a road. An existing borrow pit outside the project area will be expanded to provide material for road construction and reconstruction (less than one acre of soil is expected to be permanently taken out of production). Roads, streams, and areas cleared of leaves and other fuels using leaf blowers will be used as fire lines in most cases. If bladed or plowed fire lines are necessary, approximately 5 acres of the project area would sustain a temporary reduction in soil productivity due to fireline construction. Approximately 7 acres of soil will be returned to productivity when 4.2 miles of roads are decommissioned.

Total expected temporary reduction of soil productivity would be 513 acres (11% of the activity area), including skidding, temporary road construction, and fireline construction. Decommissioning roads and trails will reduce the temporary reduction of soil productivity to 506 acres. (Temporary roads, primary skid trails, and landings would be disked, seeded and closed following harvesting to speed the recovery of the soil productivity. Firelines would be bladed and seeded when prescribed burning is completed to speed recovery of soil productivity and to prevent erosion. Approximately 6 acres of soil would be permanently taken out of production due to realignment and widening during road reconstruction and borrow pit expansion. However, road reconstruction would stabilize these roads and prevent loss of productivity on soils adjacent to these roads and would reduce erosion and sedimentation. Road maintenance would also prevent the loss of

productivity on soils adjacent to the roads by helping to control runoff. Less than 15% of an activity area can sustain a reduction in soil productivity, according to the LRMP standard (FW85 LRMP p. 3-12). If more than 15% of the activity area sustains a reduction in soil productivity, mitigation measures must be installed to reduce the temporary loss in soil productivity below 15%. The documentation for temporary reduction in soil productivity can be found in the analysis file.

Wildlife opening construction/restoration would cause some soil disturbance and a temporary increase in erosion. Disking, seeding, and fertilizing would quickly reduce the impacts on soil productivity and erosion.

Placement of large woody material in streams could cause a slight increase in erosion at points along the streams where trees are felled into the stream, but these areas should revegetate quickly and erosion will decline to natural levels.

Site prep, release, and precommercial thinning would have little impact on soils because hand tools would be used. Treatment of invasive species with hand tools and chemicals is also expected to have little or no impact on soils. Burning was included in the impacts.

The following is a summary of the effects of the proposed herbicides on soils.

Triclopyr is absorbed by plant roots, but it is not considered effective as a soil-applied herbicide. Triclopyr is adsorbed primarily to organic matter particles in soil. The organic matter content is the primary factor in the degree of soil adsorption. Long-term forest and pasture field studies found very little indication that triclopyr will leach substantially either horizontally or vertically in loamy soils (SERA, Inc. 1996c cited in USFS PNW Region 1996). Microorganisms degrade triclopyr readily. It degrades more rapidly under warm, moist conditions which favor microbial activity. The average half life for triclopyr in soil is 30 days (Tu et. al. 2001). Triclopyr did not affect the growth of soil microorganisms up to 500 parts per million (Forest Service 1984). Triclopyr can be slightly toxic to bacteria, actinomycetes and fungi (Sapundzhieva, 1987 cited in Brown et. al. 1990). The warm temperatures at the time of application and the high density of plant roots are expected to rapidly degrade triclopyr.

Imazapyr is relatively non-toxic to soil microorganisms, aquatic invertebrates, and fish. Effects on bacteria appear to be highly species specific with variations in sensitivity of up to a factor of 100. Imazapyr appears to have the potential to shift bacterial soil populations that contain sensitive species of bacteria. There does not appear to be any basis for asserting that imazapyr is likely to adversely affect microorganisms in soil. If imazapyr were extremely toxic to terrestrial microorganisms that are important for the maintenance of soil suitable for plant growth, it seems reasonable to assume that secondary signs of injury to microbial populations would have been reported (Durkin and Follansbee 2004). Degradation halftime in soils ranges from 25 to 180 days.

Glyphosate is readily absorbed by foliage. It had practically no leaching characteristics because it binds tightly to the soil. In soil, it is highly susceptible to degradation by microorganisms, being converted to natural products such as carbon dioxide and water. Persistence in soils is about two months or less.

Nutrient Cycling

Pine needles have the highest concentration of all nutrients compared to other parts of the tree (Rolfe et. al. 1976 and Jorgensen and Wells. 1986). Overall, an average of about 31% of the total nutrients was found in the needle component, 28% in the branches and 42% in the bole of loblolly and shortleaf pines (Rolfe et. al. 1976). Stump soil the soil that is directly under tree stumps makes up approximately 1.2% of the total soil volume, but contained 10% and 4% of the total soil carbon and nitrogen (Sucre and Fox 2009). Stem-only removal for wildfire risk reduction and bio-energy production would have little impact on total soil C and N pools (Jurgensen et. al. 2011). Only the bole of the trees will be removed in the proposed harvests, so about 42% of the nutrients in the harvested trees will be removed from the harvest areas. The nutrients in the needles, branches, stumps, and roots will be left on the harvested areas.

In a review of the impacts of shortleaf pine-hardwood forest management on soils in the Ouachita Highlands Liechty and others (2002) concluded that forest management can alter soil nutrient status and organic matter contents, these changes should not reduce soil productivity at least over short time periods (3-8 yr.). They recommended emphasizing research that will elucidate how, if, and to what degree forest management

practices alter important soil/ecosystem processes such as decomposition, nutrient cycling, and nutrient uptake.

Soil organic matter plays a key role in nutrient cycling, cation exchange, and water retention in soils. When organic matter is combusted, the stored nutrients are either volatilized or are changed into highly available forms that can be readily taken up by microbial organisms and vegetation (Knoepp, DeBano, and Neary 2005). The magnitude of nutrient losses during burning is positively and linearly correlated with fuel consumption (Hough 1981, Raison et al, 1985a; Schoch and Binkley, 1986 cited in Carter and Foster 2003). Liechty and others (2004) concluded that shortleaf pine-bluestem restoration, which includes harvesting, midstory reductions, and prescribed fire, can alter nutrient availability within surface soils. They found that pH, Ca, total N, C, and C:N ratios were increased by approximately 20 years of restoration activities.

Low-severity prescribed fire has a minimal effect on soil biota because maximum temperatures are generally nonlethal, except for the upper litter layer, and consumption of forest floor habitat is limited (Busse and DeBano 2005).

Forest Plan objectives and standards serve to protect soil productivity and nutrient pools and cycling processes. Specific standards include FW85 which requires that organic layers, topsoil, and the root mat be left intact on 85% or more of activity areas, FW81 which requires that 50 square feet per acre of basal area be left in stream side management zones, FW33 which requires that six snags per acre be left for wildlife habitat (indirectly benefits soil productivity and nutrient pools), and FW18 which requires that mature forest cover be maintained 100 foot distance from the top and 200 foot distance from the bottom of bluffs.

Cumulative Effects
There is a potential for additional temporary loss in soil productivity in the seed tree units that have seed tree removal harvest planned. An estimated three acres of these units have a temporary loss in soil productivity that occurred during the initial preparation harvest. Four acres of additional temporary loss of soil productivity is estimated for these units when the seedtree removal harvest is done. The existing and estimated additional temporary loss in soil productivity equals 7 acres which is 10 percent of the seedtree harvest and seed tree removal harvest area.

Seed tree removal harvest is proposed for the 378 acres of shelterwood harvest. Approximately 34 acres of soil in these units is expected to sustain a temporary loss in soil productivity due to the initial shelterwood preparation harvest. An additional 15 acres of soil is estimated to sustain a temporary loss in soil productiviity due to the removal of the seedtrees in the future. The existing and estimated additional temporary loss in soil productivity equals 49 acres which is 13 percent of the shelterwood harvest and seed tree removal area. The actual amount of the temporary loss of soil productivity is expected to be less because the same skid trails that were used in the initial harvest will be used and erosion control measures will speed the recovery of the soil during the interval between the first and second harvest.

The cumulative effects are not significant because the existing and estimated temporary loss in soil productivity is within the Revised Forest Land and Resource Management Plan standard of maintaining the soil organic layers, topsoil, and root mat on at least 85% of an activity area .

Alternative 2 (No Action)
Road reconstruction, realignment and maintenance would not occur and roads would continue to erode. Road decommission would not occur and the soils in and adjacent to these roads would not be returned to productivity. Existing soil processes would continue.

B. WATER QUALITY

Existing Condition

Watersheds in the United States are divided into progressively smaller units known as hydrologic units, recognized by the U.S. Geological Survey (USGS) as regions, sub-regions, basin, and sub-basin units. This hierarchical division of watershed boundaries is useful for assigning address-like codes to drainage basins. This project area falls within the Arkansas-White-Red region (11), the Arkansas sub-region (1111), the Lower Arkansas- Fourche La Fave basin (111102), and the Petit Jean sub-basin unit (11110204) (U.S. Geological

Survey, 2003). The Ozark-St. Francis National Forest further classifies land areas into two progressively smaller units: watersheds and sub-watersheds. The proposed project falls into the Chickalah (1111020404) watershed. At the smallest scale, the proposed project is located within three sub-watersheds as noted in the table below. These sub-basins or 6th level HUC areas will serve as the analysis area for the proposed project with respect to water resources.

Table 4: 6th Level Watersheds within the Project Area.

Hydrologic Unit Code	Name	Total Acres	Project Area Acres
111102040403	Spring Creek-Petit Jean River	18,738	3,513
111102040405	Upper Chickalah Creek	24,827	413
111102040407	Prairie Creek-Petit Jean River	18,038	1,332
111102040406	Lower Chickalah Creek	23,466	9

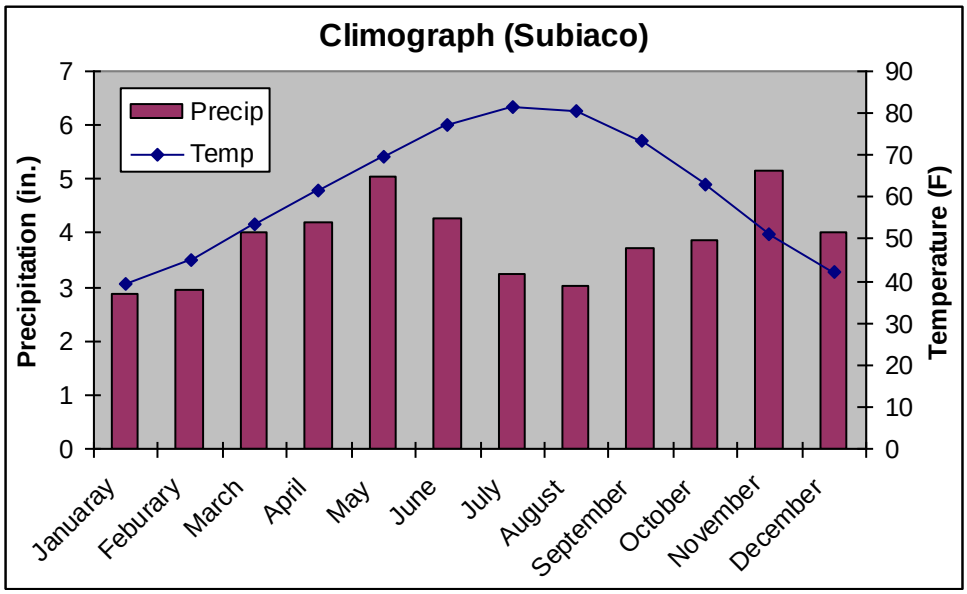
The project area and the sub-basin analysis area support streams and rivers that have a trellised drainage pattern. Trellised drainage patterns typically have short, closely spaced tributaries, which can result in rapid storm responses. There are over 166 miles of streams in the analysis area sub-watersheds. The proposed project area is immediately associated with only 14 miles of streams. The primary streams that are found in the project area are Prairie Creek, White Creek, Spring Creek, Bob Barnes Branch, Box Spring Branch, Horn Branch, Long Branch, Jordan Branch, McCargo Branch and Dooley Branch. Snake Branch flows westward along much of the northern border of the project area. Several of these streams feed Spring Lake which supplies water to Spring Creek, a tributary of the Petit Jean River. There is a dam on Spring Creek that forms the lake which is used for recreation.

The project area geology consists of Pennsylvanian age clastic sedimentary rocks of the Atoka, Hartshorne and McAlester formations (McFarland, 2004). These are primarily sandstones and shales that are not particularly good aquifers. Therefore, the base flow contributions necessary to maintain perennial streams are highly variable and associated with seasonal climatic variation. This is further documented by the Arkansas Geological Commission's (1975) low-flow determination of Spring Creek and nearby Chickalah Creek indicating base flows (exceeded 90% of time) of 0.1 and 0.0 cubic feet per second, respectively.

Climate information obtained for the project area was derived from information for the town of Subiaco, AR (U.S. Department of Agriculture – Natural Resources Conservation Service, 2005). The bars on the graph in

Figure 6 indicate average precipitation and the dotted line shows the average temperature. Mid-winter and late summer are found to be the driest portions of the year, this combined with the high temperatures indicated for July and August suggests that stream flow would most likely be the lowest during the late summer.

Figure 1. Climate Information for Water Resource Analysis



Within the 6th level watershed analysis area, only approximately 13% of the combined watersheds is administered by the Forest Service, including 3,183 acres of the Prairie Creek-Petit Jean River sub-watershed that fall within the Ouachita National Forest. This leaves a sizable proportion of the land within the watersheds as privately owned. Approximately 81% of the analysis area is forested. The balance of the watershed land uses are mainly pastures.

Forested land uses indicate a stable landscape that results in minimal amounts of natural or background erosion, especially for Arkansas (Miller and Liechty, 2001). For many parts of the Ozark-St. Francis NF, the prevalent soil cover contains many rocks and rock fragments which ultimately limit the erosive susceptibility of the soils. Measured erosion for minimally disturbed forest lands rarely exceed 0.25 tons per acre where soil erosion from cropland has been estimated at 3.8 tons per acre (Patric et al., 1984; U.S. Department of Agriculture – Soil Conservation Service, 1989).

Within the analysis area, roads are found both within the forest boundaries and outside the forest boundaries. There are approximately 43 miles of roads on the forest within the analysis area. Within the project area, there are approximately 7 stream crossings where the current road system crosses or intersects a stream.

There are some small inclusions of wetlands in the Spadra Fine Sandy Loam soil map unit that are found in small depressions. This identification was made by comparing the project area to numerous data sources of wetland location information including: National Wetland Inventory database; FEMA flood maps; STATSGO soil use database; the USGS wetlands, swamps, and marsh DLG coverage; and detailed forest level soil survey information.

Floodplains were identified on the forest in the vicinity of the project area by comparing the project area with information from the STATSGO soil database and the detailed forest level soil survey. These areas were mainly found to occur where Spadra Fine Sandy Loam soils were present along the banks of White Creek, Dooley Branch, Box Spring Branch and Prairie Creek.

The proposed project is located in the Arkansas River Valley ecoregion as identified by the Environmental Protection Agency (EPA) as a revision of work produced by Omernick (1987). These are the same ecoregion divisions recognized by the state for use in defining water quality standards. Thus, water quality standards for the project area, and the sub-watershed analysis areas for this project, are determined by the Arkansas Pollution Control and Ecology Commission Regulation 2 – Water Quality Standards for Surface Water (2011). The designated uses assigned to the surface waters in the project area are as follows: for all

waters, secondary contact recreation, domestic, industrial and agricultural water supply, seasonal Arkansas River Valley fishery. For surface water where the watershed is greater than 10 square miles, and all lakes and reservoirs, the designated uses are the same as above but include primary contact recreation and perennial Arkansas River Valley fishery. There are no 303d listed streams (impaired water bodies) within these watershed analysis area boundaries.

The U.S. Geological Survey's Ozark Plateaus National Water Quality Assessment Program has studied existing land uses in the region and their impacts on water quality. Trends that show increased nitrogen, phosphorous, and coliform bacteria concentrations occur with increases in agricultural and urban land uses (Davis and Bell, 1998). Forested land use has a much lower concentration of these constituents. This data does not isolate the direct or transient effects of timber harvest on nutrients but it does illustrate the water quality impacts of alternative land uses in the Ozarks and surrounding Arkansas Landscapes.

Direct, Indirect, and Cumulative Effects

Alternative 1

The main issue with respect to forest management activities and water quality are effects to water quality that may result from the proposed project; changes to water quality should not exceed the standards determined for the identified designated uses. The activities which may illicit direct and indirect effects are those of vegetation management, silvicultural site preparation, road construction, and prescribed burning.

In a summary of silviculture activity effects in the Ozark-Ouachita Highlands, Lawson (1986) documented the undisturbed erosion from small watersheds and the amount of sediment produced as a result of vegetation management practices. The undisturbed sites produced about 13.8 lbs/acre of sediment with 70% of this amount attributed to large precipitation events. A seedtree harvest was described to produce three times this amount of sediment during the first year after harvest with 31.3 lbs/acre. Three years after the treatment the erosion rates were similar to the undisturbed state. This is roughly equivalent to a 5-gallon bucket of soil. Another study by Lawson and Hileman (1982) investigated the effects of seedtree removal and site preparation burning. The results indicated that there were no statistically significant differences in stream turbidity between seedtree removal sites and undisturbed control sites. Thus, seedtree silvicultural practices in Arkansas would result in the production of sediment, but at levels below those found on typically managed forest lands of the eastern United States. Therefore, the vegetation management practices proposed for this project would result in temporary increases of sediment but at relatively low levels and for a short duration.

Using paired watershed studies for regions of the United States, effects of silviculture practices on annual average stream discharge was depicted by Stednick (1996). In this study, the actions necessary for producing measurable increases in water yield from forests in Arkansas was determined to be a 50% reduction in basal area across an entire watershed. This level of vegetation harvest would result in an increase of roughly six inches above normal runoff values for the first year. The recovery period for water yield to return to pretreatment level was found to be a function of vegetation re-growth. For Arkansas, this means that water yields should return to the pretreatment level quite rapidly; however; changes to peak flow and storm flow timing may continue if drainage patterns are altered by activities such as road construction. Any changes to runoff timing should not result in impacts to current water uses or quality.

Long-term implications of nutrient loading after timber harvest for streams in the south were described in a study by Lynch and Edwards (1991). In this study, best management practices were used that include 100 foot wide perennial buffers, logging slash removed from streams, sale units were monitored by a responsible party, operations ceased during wet weather, roads laid out by professional, roads not exceeding 10% grade, culverts used to cross perennial streams and removed when done, water bars utilized, roads gated, and filtration strips maintained. The results indicated that nutrients would not exceed water quality standards and that only during the treatment year would nutrients show a substantial increase. An important conclusion was the demonstration of the effectiveness of Best Management Practices (BMPs) for controlling nutrient export.

Herbicide use in this alternative is not broadcasted but applied by direct injection, cut surface, or foliar spray. For these purposes, herbicide use is infrequent (1-2 times per 100 yrs.) and direct application methods would minimize off-site movement. Forestwide Standards for herbicide application would be followed as well as appropriate BMPs designed to limit risk to water quality. Monitoring for herbicides used on the forest has been a continuous policy on Ozark-St. Francis National Forests for the last 10 years. Results from this

monitoring have not documented any considerable concentrations of herbicides off-site from their application (unpublished reports). Other monitoring suggests that subsequent to runoff producing precipitation events, concentrations of herbicide (triclopyr) in ephemeral streams with BMP protections were very small and well below any significant risk concentration (unpublished report). When herbicide fate is measured in runoff water, two common outcomes are apparent. First, measured peak concentrations are of short duration. Second, the highest concentrations occur when buffer strips are not used on streams (Neary and Michael, 1996).

Exposure is determined by such things as application rate, chemical behavior in the environment and biological factors. Many chemicals used in forestry applications break down fairly rapidly under normal conditions, usually within several weeks. Chemicals can enter streams through a variety of mechanisms - by direct application, drift, mobilization of residues in water, overland flow, and leaching. The most significant transport pathway would be direct application, drift, and mobilization during periods of heavy precipitation and overland flow. The most effective means for reducing this likelihood is to maintain a buffer between the area for use and waterbodies, and to plan appropriately for application time frames.

Herbicide applications to control competing vegetation do not disturb the nutrient rich topsoil layer, do not create additional bare soil, and do not adversely affect watershed condition when used responsibly (Neary and Michael, 1996). By utilizing herbicides, the organic matter is left in place and off-site soil movement does not increase the loss of nutrients following harvest activities compared to the other types of management practices. Maxwell and Neary (1991) concluded in a review that the impact of vegetation management techniques on erosion and sedimentation of water resources occurs increasingly in this order – herbicides, fire, then mechanical. They also concluded that sediment losses during inter-rotation vegetation management could be sharply reduced by using herbicides and moderate burning instead of mechanical methods and heavy burning.

Forestry use of herbicides poses a low pollution risk to groundwater because of its use pattern. Herbicide use in forestry is only a fraction of agricultural usage and likely to occur only once or twice over rotations of 25 and 75 years. The greatest potential hazard to groundwater comes from stored concentrates, not operational application of diluted mixtures (Neary and Michael, 1996). Regional, confined, groundwater aquifers are not likely to be affected by silviculture herbicides (Neary, 1985). Surface unconfined aquifers in the immediate vicinity of herbicide application zones have the most potential for contamination. It is these aquifers which are directly exposed to leaching of residues from the root zone. The only known groundwater contamination incidents of an importance (contamination of bedrock aquifers, persisting more than 6 months, concentrations in excess of the water quality standard, etc.) in the southeastern United States, where significant amounts of forestry herbicides are used, involved extremely high rates of application, or spills of concentrates. In these situations, herbicide residue was detected in ground water four to five years after the contamination. These situations are definitely not typical of operational use of forestry herbicides. Proper handling precautions during herbicide transport, storage, mixing-loading, and clean-up are extremely important for preventing groundwater contamination (Neary and Michael, 1996).

Pesticides are common chemicals used in a variety of applications and have been found in surface water, ground water, and in wells. Often these residue concentrations are far below levels harmful to human health and the occurrence is infrequent (Larson et al. 1997). Reports of pesticide contamination of water are usually from agricultural uses or urban applications, but the potential for contamination from forest vegetation management program exists (Kolpin et al. 1997; Koterba et al. 1993; Michael et al., 2000).

Although short term, low-level stream contamination has been observed for ephemeral to first order streams draining studied sites, levels of herbicides in these streams has been neither of sufficient concentration nor of sufficient residence time to cause observable impacts on aquatic ecosystems (Michael et al., 2000). These studies have confirmed, with a few exceptions, the absence of significant contamination of surface water. Thus, herbicides used properly can help protect water quality in the reduction of sediment in streams while accomplishing forest management goals. It is imperative that pesticides, unless clearly labeled for aquatic uses, must not be applied directly to water, and that pesticides should be used around water resources which are particularly sensitive only after careful considerations of the ramifications (Michael et al., 2000).

From a review of literature surrounding herbicide application and use on forest lands, and monitoring conducted on the Ozark-St. Francis National Forest, it has been determined that the selection of this

alternative could potentially result in low levels of herbicide residues entering waterbodies within the project area (SO unpublished reports). However, the levels found in the past and those anticipated for the future, are expected to be very small, and not in excess of the levels of concern established by the EPA. The Ozark-St. Francis Nation Forests utilize standards for herbicide application which require buffers between treated vegetation and waterbodies, as well as standards to ensure that drift and direct application to waterbodies does not occur. This alternative includes the use of BMP practices and monitoring to ensure environmental quality is maintained.

Roads are the most common source of accelerated erosion on National Forest lands. Road generated sediment may result from the erosion of cut and fill slopes, ditches, road surfaces, and road maintenance operations. Unpaved roads paralleling and crossing streams pose specific risks to water quality as they often maintain direct linkages with the stream channel. Roads result in three primary effects on forested lands. They can intercept rainfall directly, concentrate flow, and divert or reroute water from traditional hydrologic pathways. Through these actions, road systems mimic the stream channel network, effectively increasing the drainage density of streams in the landscape. This may result in modifications to the timing of water delivery to stream systems; however, this is not expected to be a significant nor measurable difference from current conditions. The activities of the proposed action would work toward 'disconnecting' the road system from the stream network.

Temporary road construction, as a result of this action, would create 15.7 miles of roads in the project area. Upon completion of harvesting, these roads would be seeded, waterbarred and blocked. Approximately 0.6 mile of new road would be constructed for this project. This road would be closed after use and only opened for administrative use. Guidance provided in the LRMP and the Arkansas Forestry Commission's Best Management Practices for Water Quality Protection outline the mitigation measures necessary to conduct these activities while controlling contributions to non-point source pollution. The remainder of the road work is road reconstruction, road maintenance, road decommissioning and road closure; which when properly conducted, should result in a decrease in sediment production, thus a benefit.

The effects of prescribed fire on water yield and timing, erosion, and nutrient cycling depend on fire severity, fuel characteristics, soil moisture, and recurrence interval, and primarily the amount of ground cover removal. Less intense fires result in effects of less magnitude than moderate to severe fire intensity (Marion, 2004). Controlled burns designed to meet fuel reduction, wildlife, recreation, watershed, or ecological objectives are typically planned to be less intense than a wildfire. There is little evidence that water yield increases substantially following prescribed burning.

Erosion following a prescribed burn depends on soil erodibility, slope, precipitation timing, volume, intensity, fire severity, and soil cover remaining. For low intensity fires that avoid complete consumption of the organic layers, erosion has been found to not leave the treated site or be transported to stream channels (Fulton and West, 2002). The organic layer and root mat remains intact after low severity fires.

Erosion from prescribed burning is typically less than road and skid trail construction or intensive site preparation (Golden et. al 1984). Erosion following prescribed fire is mainly created from plowed fire lines as opposed to the general treatment area (Van Lear et. al., 1985). Minor increases in stormflow and nutrients return to pre-treatment levels within 3 years.

Prescribed fire can affect water quality by altering the nutrient cycle within soils and increasing bioavailability of certain nutrients. Prescribed fire alone is not expected to increase nutrient content of runoff.

The direct and indirect impacts from this project are not expected to contribute to degradation of the current water quality. Implementation of the activities associated with this alternative would result in some of the above mentioned effects to water quantity and quality; these effects have been shown from past research to be minimal and short lived in this part of Arkansas. The most likely effects from this alternative, beyond current conditions, are a short-term increase in sediment resulting mainly from road activities and minimal increases in water production. With the application of the Arkansas Forestry Commission's Best Management Practices for Water Quality Protection, current Forest Plan standards, and any other mitigation measures noted in this EA, the activities of this alternative should not result in significant effects to the water resources. Road stabilization through maintenance and reconstruction, erosion control through revegetation of disturbed ground, and observance of streamside management zones around surface water features are typical measures used to ensure the mitigation of adverse effects which may occur.

The activities described in this alternative are not expected to affect wetland areas or floodplains.

For this analysis, the cumulative effects to water resources would be bound by the Spring Creek, Upper Chickalah, and Prairie Creek Watersheds, the 6th level watersheds in which the project is located. Cumulative effects result from practices that occur throughout the watershed, on both private and public lands. Activities and land uses identified for areas not administered by the Forest Service were determined from publicly available data. The major non-point source pollution concern that arises from Forest Service activities is that of soil erosion which can potentially result in increased sedimentation of aquatic habitats or threaten water quality as turbidity.

Computer modeling is one tool that can be used for screening watersheds for possible problems. The cumulative effects analysis estimates sediment yield from both public and private lands, the existing road network, and from expected current and future activities. Current and future sediment yield is compared to estimates of an undisturbed landscape (or past condition). An undisturbed landscape is described as an entirely forested watershed without roads. Sediment increases are then calculated as a percent above the undisturbed amount. This value is compared to potential risk values for identifying levels of concern for watershed conditions. These risk indicator values were empirically determined using a relationship between sediment values and the condition of the fisheries from select locations across the area.

The cumulative effects analysis assumes that particular activities occur on public and private lands. The assumption is made that all the activities on public lands as described in the Propose Action, would occur during a one year time frame, or as an instantaneous event. In practice, these activities are usually spread over a number of years, thus amortizing the potential effects over the life of any resulting projects. Assumptions are included in the determination of the potential risk indicator values; these values were determined on a smaller-scale, ecoregion basis, using community based fish information. Different guilds within the fish communities were analyzed for predictive patterns of response to sediment loading. The most responsive patterns were used to set the risk level values. This allows for a determination of the 'worst case' scenario, providing a conservative estimate of effects to the water resources and designated use fisheries.

Within the computer model tool, there are two risk values for every 6th level watershed; the first separates the low and moderate concern level and the second separates the moderate and high concern level. A low concern indicates a minimal risk to water quality, or no expected adverse effects to water resources or the designated uses. A moderate concern indicates that care should be taken designing and implementing the project to avoid adverse effects. Proper application of all forest plan standards and Arkansas Forestry Commission BMPs should be verified for implementation. Assuming these guidelines are correctly applied, this project would result in minimal risks to water quality. If these standards are not applied then a greater risk to water quality results. A high concern signals that the water resources may be threatened by the current or future state of the watershed. Proposed activities should only be conducted with the application of appropriate forest plan standards and BMPs. Short-term adverse effects to water resources may result from activities captured in the effects analysis, both on public as well as private lands. Additional monitoring is necessary to determine that no adverse effects to the water resources result from Forest Service activities; this includes monitoring for adequate BMP compliance.

The water resource cumulative effects analysis was completed based on the activities described in this document. All supporting material for this model has been included in the project planning files. The Upper Chickalah Creek watershed shows a Low Concern Level both before and after project activities are applied. The Spring Creek and Prairie Creek watersheds each have a Moderate Concern Level, even before any project activities are applied. This is likely due to the high percentage of private land and having approximately 20% pasture land within the watersheds. The proposed action maintains the Moderate Concern Level for the future condition of these watersheds. It should be noted that the watershed screening tool was developed using fishery information available from larger areas, in this case the Arkansas River Valley, and thus includes larger varieties of fish species and looks at every setting within that eco-region. In reality, most tributaries on National Forest System lands in this area are considered headwater streams and are much smaller and less diverse than the fish surveys used to build the model. In fact, many of the streams in the analysis area are dry much of the year and do not support fisheries.

The cumulative effects analysis indicates elevated risks to the water resource's current condition. A number of factors contribute to this outcome. No Forest Service activities, other than existing roads, contribute to the current conditions; these are mainly the result of off-forest activities and land uses. One of the initial

conditions contributing to the elevated concerns is the land use patterns off public lands. Pastures, agriculture and cultivated field type land uses pose greater risks to water resources through non-point source pollution as they traditionally require a more intensive management regime than forested landscapes. From a water quality perspective, intensive animal farming operations increase the risks of adverse effects to water resources within the watershed. A large number of chicken houses is present off the forest but within the watershed.

The activities proposed by the Forest Service for the proposed action would result in additional sediment production from the landscape, but from a watershed perspective, contribute only a small (if any) increase to the overall estimated sediment yield. It is most likely that these activities would take place over a 3 to 5 year period instead of instantaneously as predicted by the analysis, thus reducing acute effects. The use of RLRMP standards and Arkansas Forestry Commission BMPs are expected to reduce the impacts of the proposed activities. Monitoring in the form of subsequent fisheries evaluation and BMP compliance checks should be adequate to discern any adverse effects that may result from the implementation of the proposed action. Also, in the case of this watershed, almost all the water from the project portion of the Spring Creek watershed flows to Spring Lake prior to exiting National Forest lands. Any additional sediment produced from project activities should be reduced significantly through settling in the lake. The small amount of additional sediment that may result from project activities is not expected to adversely affect the lake.

Because the model indicates a moderate risk for two watersheds in the project area, BMP reviews originating from the Supervisor's Office will be conducted at an increased frequency (as funding allows) in order to insure that the practices are being followed and are effective at reducing erosion.

Alternative 2

There would be no direct effects from this alternative because no activities would result from the selection of this alternative. The current trends and conditions are expected to continue. Indirect effects would continue to result from the existing conditions of the project area. The effects of vegetation on water yield within the watershed would continue through evapotranspiration processes. Roads that do not receive necessary maintenance would continue to pose a chronic threat to water quality as problem erosion areas would continue to exist, or worsen.

Roads are the most common source of accelerated erosion on National Forest lands. Roads generate sediment from the erosion of excavated surfaces, ditches, and road maintenance operations. Raw ditch lines and roadbeds would be a continual source of sediment, usually due to lack of maintenance, inadequate maintenance, excessive ditch line disturbance, or poorly timed maintenance. As a result of Alternative 2, roads in need of maintenance and reconstruction would not receive the necessary upgrades to minimize resource conditions. Unpaved roads paralleling and crossing streams would continue to pose specific risks to water quality as they often maintain linkages with the stream channel.

C. AIR QUALITY

Existing Condition

The climate in the area is defined by hot humid summers with temperatures ranging from 70 to 94 degrees Fahrenheit (Weatherbase, 2011). The autumns are warm and moist with average temperatures ranging from 51 to 75 degrees Fahrenheit. The winters can be cold, with temperatures ranging from 32 to 55 degrees Fahrenheit. The springtime is cool and moist with temperatures ranging from 50 to 75 degrees Fahrenheit. The monthly precipitation ranges from a low in the winter of 2.2 inches to a high of 5.6 inches in the spring.

The major physiographic features influencing the climate, air movement, and dispersion of smoke in this area are Chickalah Mountain, Spring Lake and Spring Creek. The project area is on the southeast part of Chickalah Mountain. Other small-entrenched valley areas also occur throughout the proposed burn areas in all directions. The Harkey Valley boarders the north edge of the proposed burn areas from east to west. This valley can act as a cold sink and can trap smoke or channel smoke east along Chickalah Creek drainage. This may cause it to disseminate downstream or down valley into some nearby communities.

Table 5 shows the National Ambient Air Quality Standards set by the Environmental Protection Agency (EPA) Office of Air Quality Planning and Standards (OAQPS), for six principle pollutants called criteria

pollutants (U.S. Environmental Protection Agency, 2011b). The State of Arkansas uses the same standards for the criteria pollutants as EPA.

The boundaries of the analysis area for air quality are roughly the smoke sensitive receptors. (See Table 9 for a list of the receptors.)

Table 5: National Ambient Air Quality Standards for the Six Criteria Pollutants.

Pollutant	Averaging Time	Primary Standards* Level	Secondary Standards** Level
Carbon Monoxide (CO)	8-hour	9.0 ppm (10 mg/m^3)	N/A
	1-hour	35.0 ppm (40 mg/m^3)	N/A
Nitrogen Dioxide (NO_2)	Annual (Arithmetic Mean)	0.053 ppm (100 µg/m^3)	Same as Primary
Ozone (O_3)	8-hour	0.075 ppm	Same as Primary
	1-hour	0.12 ppm	Same as Primary
Particulate Matter with diameters of 10 micrometers or less (PM-10)	24-hour	150.0 µg/m^3	Same as Primary
Particulate Matter with diameters of 2.5 micrometers or less (PM-2.5)	Annual (Arithmetic Mean)	15.0 µg/m^3	Same as Primary
	24-hour	35.0 µg/m^3	Same as Primary
Sulfur Dioxide (SO_2)	Annual (Arithmetic Mean)	0.03 ppm	N/A
	24-hour	0.14 ppm	N/A
	1-hour	75 ppb	N/A
Lead (Pb)	Rolling 3-Month Average	0.15 µg/m^3	Same as Primary

Units of measure: µg/m^3 – micrograms per cubic meter of air
ppm – parts per million by volume
ppb _ parts per billion by volume

*Primary Standard – This is a standard set by the Environmental Protection Agency (EPA) to protect public health, including the health of "sensitive" populations such as asthmatics, children, and the elderly.

**Secondary Standard – This is a standard set by EPA to protect public welfare. This includes, but is not limited to decreased visibility, damage to animals, crops, vegetation, and buildings.

Of the six criteria pollutants, the ones of concern for this project are PM_{10} and $PM_{2.5}$. Although Ozone, Nitrogen Dioxide, Sulfur Dioxide, and Lead are important, the levels associated with this type of project are typically well below National Ambient Air Quality Standards (NAAQS) (Sandberg and Dost 1990). Carbon

monoxide as a product of combustion is rapidly diluted at short distances from a fire and therefore poses little or no health risk to the general public.

In general, the air quality in the analysis area is good (U.S. Department of Agriculture Forest Service, 1999). Episodes of regional haze occur mainly in the spring and summer.

Lands designated as Class I Areas under the Clean Air Act Amendments of 1977 are afforded the highest level of protection from air pollutants in the nation (U.S. Environmental Protection Agency, 2011b). These lands consist of national wildernesses (Forest Service), parks (National Park Service) and wildlife refuges (U.S. Fish & Wildlife Service) in existence at the time the amendment was passed. The Clean Air Act identifies areas that are designated as Class I as "A geographic area designated for the most stringent degree of protection from future degradation of air quality." The closest Class I areas to the proposed burns are Caney Creek Wilderness area, located about 60 miles southwest of the proposed burn areas and Upper Buffalo Wilderness, located approximately 75 miles north of the proposed burn areas (U.S. Department of Interior - National Park Service, 2011).

All other lands in the nation, including the proposed project area, lie within lands designated as Class II with respect to the air resource (U.S. Environmental Protection Agency, 2011b). The Clean Air Act defines a Class II area as, "A geographic areas designated for a moderate degree of protection from future degradation of the air quality."

All proposed activities are within Yell County. As of April 21, 2011 Yell County was in attainment for all the six EPA criteria air pollutants (U.S. Environmental Protection Agency, 2011a). EPA defines attainment areas as "A geographic area in which levels of a criteria air pollutant meets the health-based primary standard (national ambient air quality standard, or NAAQS) for the pollutant." EPA defines non-attainment areas, as "A geographic area in which the level of a criteria air pollutant is higher than the level allowed by the federal standards."

The closest non-attainment area to the proposed burn sites for CO is Las Vegas, NV. This is approximately 1,360 miles to the west of the proposed burn area. The closest non-attainment area to the proposed burn sites for PM_{10} is Anthony, New Mexico, approximately 930 miles to the southwest of the proposed burn area. The closest non-attainment area to the proposed burn sites for $PM_{2.5}$ is Birmingham, Alabama, approximately 413 miles to the southeast of the burn areas. These determinations are based on the Environmental Protection Agency's (EPA) data and maps as of April 21, 2011 (U.S. Environmental Protection Agency, 2011a).

The main existing sources of PM_{10} and $PM_{2.5}$ within the analysis area are from local wood burning home units, burning on private and federal lands, fugitive dust from unsurfaced roads, and combustion engines (such as those found in motor vehicles).

Based on RLRMP direction, priorities for the air resource in the analysis area are to meet NAAQS and to protect Air Quality Related Values (AQRVs) in the Class I Area, Upper Buffalo Wilderness (RLRMP, p. 2-14). The AQRV used for Caney Creek and Upper Buffalo Wilderness Class I areas is visibility. Although there is no direct standard for visibility associated with the NAAQS, when the levels of the criteria pollutants are below the NAAQS, this too should maintain the visibility quality in the Class I areas.

Effects

Alternative 1

All analysis for the proposed project will be based on potential impacts to the identified smoke sensitive receptors with respect to the NAAQS levels for PM_{10} and $PM_{2.5}$.

All prescribed burning activities would follow guidelines in the Arkansas Smoke Management Guidelines (Arkansas Forestry Commission, 2007). The purpose of these guidelines is to assure adherence to air quality standards and to manage smoke from prescribed fire to keep the smoke's impact on people and the environment within acceptable limits established by the Clean Air Act. A burning plan is developed prior to implementation that considers wind direction and other smoke dispersal factors. The burning plan would be prepared for each burn to ensure that the combustion products (smoke) are minimized in smoke-sensitive areas. Burning would only occur when conditions are right for adequate smoke dispersal.

The smoke dispersion modeling analysis (using VSMOKE and/or VSMOKE-GIS) for this project was performed for 500.0 acres to be burned on 03/01/2014 at the time period of 1400 hours. This time period has daytime dispersion characteristics to disperse the pollutants from the fire. The location of the fire is at approximately 35.161 degrees latitude and -93.409 degrees longitude (-462132.049 meters east and 1270092.419 meters north using US Albers projection). The emission rate of $PM_{2.5}$ (fine particles) this hour was 871.5 grams/second, and carbon monoxide was 10645.9 grams/second. The heat release rate was 377096.6 megawatts. Both emission rates and the heat release rates were calculated using the Fire Emission Production Simulator (FEPS) model. The estimated background concentration of fine particles and carbon monoxide of the air carried with the winds into the fire are 5 micrograms/cubic meter and 5 parts per million, respectively. The proportion of the smoke subject to plume rise was -0.75 percent, which means 75 percent of the smoke is being dispersed gradually as it rises to the mixing height, and 25 percent is dispersed at ground level.

The meteorological conditions used in this model run were:

1.) Mixing height was 3200 feet above ground level (AGL).
2.) Transport wind speed, and surface wind speed were 15 and 9 miles per hour, respectively.
3.) The sky had 20 percent cloud cover, and the clouds were located 3000 feet above the ground.
4.) Surface temperature was 70 degrees Fahrenheit, and the relative humidity was 30 percent.
5.) The calculated stability class from VSMOKE was slightly unstable.

The VSMOKE model produces three types of outputs that estimate: a.) The ability of the atmosphere to disperse smoke and the likelihood the smoke will contribute to fog formation; b.) Downwind concentrations of particulate matter and carbon monoxide; and c.) Visibility conditions downwind of the fire.

The Dispersion Index (DI) is an estimate of the ability of the atmosphere to disperse smoke to acceptably low average concentrations downwind of one or more fires. This value could represent an area of approximately 1000 square miles under uniform weather conditions. Typically, the Dispersion Index value should be greater than 30 when igniting a large number of acres within an area. The calculated Dispersion Index value was 49, which predicts the atmosphere has a good capacity to disperse smoke.

Combining the Dispersion Index and relative humidity values provide an estimate (like is used in insurance actuary tables) of the likelihood of the smoke contributing to fog formation. The Low Visibility Occurrence Risk Index (LVORI) ranges from 1 (lowest risk) to 10 (greatest risk) and usually you want the value to be less than 4. The base line risk of having low visibility as a result of smoke contributing to fog formation is about 1 in 1000 accidents. The Low Visibility Occurrence Risk Index value for this VSMOKE analysis was 1 and this is equal to the base line.

High concentrations of particulate matter, especially fine particles ($PM_{2.5}$), and carbon monoxide can have a negative impact on people's health. The Environmental Protection Agency has developed a color coding system called the Air Quality Index (AQI) to help people understand what concentrations of air pollution may impact their health. When the AQI value is color code orange then people who are sensitive to air pollutants, or have other health problems, may experience health effects. This means they are likely to be affected at lower levels than the general public. Sensitive groups of people include the elderly, children, and people with either lung disease or heart disease. The general public is not likely to be affected when the AQI is code orange. Everyone may begin to experience health effects when AQI values are color coded as red. People who are sensitive to air pollutants may experience more serious health effects when concentrations reach code red levels. This analysis shows the air quality at downwind distances less than 1.96 miles from the edge of the fire may have a 1-hour particulate matter concentrations predicted to be code red or worse, while distances less than 6.21 miles are predicted to be code orange or worse. At distances less than 1037 feet from the edge of the fire the one-hour carbon monoxide concentrations are predicted to be code red or worse, and distances less than 0.39 miles from the fire are predicted to be code orange or worse.

Smoke can also have an impact on how far and how clearly we can see on a highway or in viewing scenery. The fine particles in the smoke are known to be able to scatter and absorb light, which can reduce visibility conditions. The visibility estimates from VSMOKE are valid only when the relative humidity is less than 70 percent. Also, the visibility estimates assume the smoke is passing in front of a person who is looking through the plume of smoke. The visibility thresholds used for this modeling analysis were to maintain a contrast ratio of greater than 0.05 and a visibility distance of 0.25 miles. Visibility conditions may exceed the

threshold less than 328 feet from the edge of the fire.

The VSMOKE-GIS model estimates where the pre-selected fine particulate matter concentrations (39, 89, 139, 352, and 527 micrograms per cubic meter) to be predicted downwind of the fire. If an analysis was conducted then the results (map) will be attached to the last page of this report. The VSMOKE-GIS analysis had daytime dispersion characteristics to disperse the pollutants from the fire and this is the same as the VSMOKE analysis. The downwind spacing interval was set at 0.025 kilometers, and the model ceased making downwind estimates at 30 miles from the edge of the fire. The stability class used for the VSMOKE-GIS analysis was moderately unstable and this is different than the calculated stability class in VSMOKE.

Figure 2. Smoke Analysis

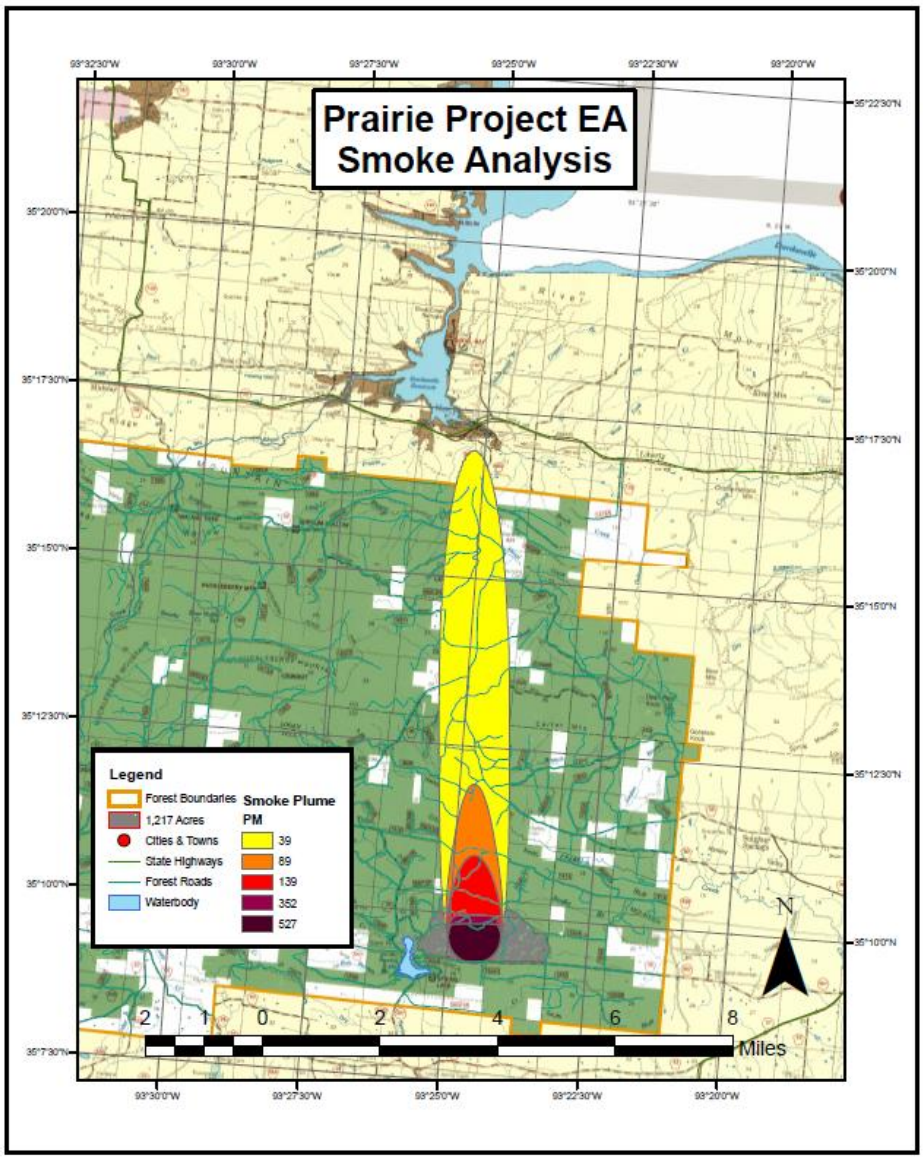


Table 6. PM2.5 & CO Concentrations

Distance from fire	PM2.5 (ug/m3)	CO (ppm)	Distance from fire	PM2.5 (ug/m3)	CO (ppm)
328 ft	1,644.62	19.13	2.47 mi	150.50	6.25
413 ft	1,438.14	17.35	3.11 mi	127.42	6.06
518 ft	1,249.33	15.73	3.92 mi	105.79	5.87
656 ft	1,081.40	14.28	4.94 mi	86.50	5.70
823 ft	929.78	12.97	6.21 mi	70.12	5.56
1037 ft	795.30	11.81	7.82 mi	56.86	5.45
0.25 mi	677.85	10.80	9.85 mi	46.67	5.36
0.31 mi	576.61	9.93	12.40 mi	39.00	5.29
0.39 mi	490.34	9.18	15.61 mi	32.99	5.24
0.49 mi	417.50	8.56	19.65 mi	28.06	5.20
0.62 mi	356.48	8.03	24.74 mi	23.97	5.16
0.78 mi	305.71	7.59	31.14 mi	20.59	5.13
0.98 mi	263.67	7.23	39.21 mi	17.81	5.11
1.24 mi	228.95	6.93	49.36 mi	15.53	5.09
1.56 mi	199.93	6.68	62.14 mi	13.65	5.07
1.96 mi	174.45	6.46			

Table 7. Visibility Chart

Distance from fire	Crossplume Visibility (miles)	Contrast Ratio (miles)	Distance from fire	Crossplume Visibility (miles)	Contrast Ratio (miles)
317 ft	0.34	0.11	2.47 mi	44.53	0.81
422 ft	0.39	0.14	3.11 mi	45.98	0.84
528 ft	0.45	0.19	3.92 mi	47.16	0.86
634 ft	0.51	0.23	4.94 mi	48.12	0.89
845 ft	0.60	0.29	6.21 mi	48.89	0.91
1056 ft	0.70	0.34	7.82 mi	49.49	0.92
0.25 mi	0.82	0.40	9.85 mi	49.87	0.93
0.31 mi	5.60	0.46	12.40 mi	50.03	0.94
0.39 mi	13.63	0.51	15.61 mi	50.07	0.95
0.49 mi	20.40	0.57	19.65 mi	50.07	0.96
0.62 mi	26.08	0.62	24.74 mi	50.07	0.96
0.78 mi	30.81	0.66	31.14 mi	50.07	0.97
0.98 mi	34.72	0.70	39.21 mi	50.07	0.97
1.24 mi	37.94	0.73	49.36 mi	50.07	0.97
1.56 mi	40.59	0.76	62.14 mi	50.07	0.98
1.96 mi	42.76	0.79			

Table 8. Plume Height and Dispersion Coefficients

Distance from fire	Plume Height (feet)	Horizontal Dispersion Coefficient (feet)	Vertical Dispersion Coefficient (feet)	Distance from fire	Plume Height (feet)	Horizontal Dispersion Coefficient (feet)	Vertical Dispersion Coefficient (feet)
317 ft	2,514	55	39	2.47 mi	3,200	1,191	720
422 ft	2,931	64	44	3.11 mi	3,200	1,462	886
528 ft	3,200	76	51	3.92 mi	3,200	1,794	1,092
634 ft	3,200	91	59	4.94 mi	3,200	2,201	1,345
845 ft	3,200	109	70	6.21 mi	3,200	2,700	1,658
1056 ft	3,200	131	83	7.82 mi	3,200	3,310	2,044
0.25 mi	3,200	158	99	9.85 mi	3,200	4,056	2,521
0.31 mi	3,200	192	119	12.40 mi	3,200	4,967	3,109
0.39 mi	3,200	234	144	15.61 mi	3,200	6,079	3,836
0.49 mi	3,200	286	175	19.65 mi	3,200	7,435	4,733
0.62 mi	3,200	350	212	24.74 mi	3,200	9,087	5,840
0.78 mi	3,200	428	259	31.14 mi	3,200	11,096	7,207
0.98 mi	3,200	525	317	39.21 mi	3,200	13,539	8,894
1.24 mi	3,200	644	389	49.36 mi	3,200	16,503	10,977
1.56 mi	3,200	790	477	62.14 mi	3,200	20,097	13,548
1.96 mi	3,200	970	586				

The proposed project would be implemented in an attainment area and, thus, would comply with the general conformity regulation.

Table 9 shows the smoke sensitive receptors that were used in the VSmoke model to analyze the impacts of the various alternatives at these locations. They were chosen based in part on proximity to the proposed project, known smoke concerns, safety concerns, and ability to represent similar locations in the area.

If climatic conditions change quickly, some travel ways, such as State Highway 27 and 22, may experience decreases in visibility. These impacts can be mitigated with the use of flaggers, notification of state highway and local police departments, signing and other mitigation measures.

Table 9: Smoke Sensitive Receptors.

Smoke Sensitive Receptor	Distance from Receptor to Fire In miles	Direction from Receptor To Fire
State Highway 27	3.5	Northwest
Belleville	5.2	Northeast
Havana	8.1	Northeast
Danville	7.0	North
Mt. Magazine State Park	12.7	East
New Blaine	9.3	South
Interstate 40	18.0	South
Dardanelle	13.79	West Southwest
Russellville	17.1	Southwest

The closest Class I Areas of concern with respect to Regional Haze compliance is the Caney Creek and Upper Buffalo Wilderness Areas. As previously identified, the level of potential $PM_{2.5}$ and PM_{10} would be well below the lower limit accepted by the EPA, and the activities would occur in an attainment area. Considering these two factors and due to the lack of State-specific direction on implementing the Regional Haze Regulation, it is believed that the intent of the regulation in protecting visibility within Caney Creek and Upper Buffalo Class I Areas is being met.

Air quality cumulative effects includes, but is not limited to activities such as operation of combustion engines (i.e. vehicles, lawn mowers, turbines etc.), use of fireplaces, dust from surfaced and unsurfaced roads, wildfires, industrial emissions, etc. These activities, combined with the proposed burning and the implementation of the mitigation measures, are not expected to exceed the NAAQS. The implementation of the proposed projects would not move Yell County towards non-attainment with the implementation of the identified mitigation measures. If an exceedance should occur, the Forest Service would work with the Arkansas Department of Environmental Quality to develop a State Implementation Plan that would allow the state to make reasonable progress towards meeting NAAQS and allowing the Forest Service to continuing using prescribed fire as a tool.

The prescribed treatments should not detrimentally impact the quality of air in the smoke sensitive receptors based on these factors: (1) the most recent of EPA-air quality data for Yell County, (2) $PM_{2.5}$ and PM_{10} emissions from the proposed burning being below the acceptable limit set by EPA at any smoke receptor, (3) Forest Service compliance with NAAQS, and (4) meeting general conformity and meeting the intent of the Regional Haze regulation. The prescribed burning in Alternative 1 is expected to have negligible short-term effects (less than 12 hours), on air quality.

Alternative 2

No prescribed burning would be associated with this alternative. Therefore, air quality would remain at its current level. However, should a wildfire occur within the project boundary the current level of air quality could be expected to diminish. Furthermore, since a wildfire would not burn under the same parameters as a controlled burn would, the effects associated with smoke direction and duration cannot be predicted.

D. CLIMATE CHANGE

Existing Condition

Although it is possible to quantify a project's direct effects on carbon sequestration and GHG emissions, there is no certainty about the actual intensity of individual project indirect effects on global climate change. Uncertainty in climate change effects is expected because it is not possible to meaningfully link individual project actions to quantitative effects on climatic patterns. Complete quantifiable information about project effects on global climate change is not currently possible and is not essential to a reasoned choice among alternatives. However, based on climate change science, we can recognize the relative potential of some types of proposals and alternatives to affect or influence climate change and therefore provide qualitative analysis to help inform project decisions. Climate change in this assessment focused on using qualitative rather than quantitative analysis. A report using the Template for Assessing Climate Change Impacts and Management Options (TACCIMO) is attached as an Appendix D.

Forests play a major role in the global carbon cycle by storing carbon in live plant biomass (approximately 50% of dry plant biomass is carbon), in dead plant material, and in soils. Forests contain three-fourths of all plant biomass on earth, and nearly half of all soil carbon. The amount stored represents the balance between absorbing carbon dioxide ($CO_{2)}$ from the atmosphere in the process of photosynthesis and releasing carbon into the atmosphere through live plant respiration, decomposition of dead organic matter, and burning of biomass (Krankina and Harmon, 2006).

Through the process of photosynthesis, carbon is removed from the atmospheric pool. About half the carbon absorbed through photosynthesis is later released by plants through respiration as they use their own energy to grow. The rest is either stored in the plant, transferred to the soil where it may persist for a very long time in the form of organic matter, or transported through the food chain to support other forms of terrestrial life. When plants die and decompose, or when biomass or its ancient remains in the form of fossil fuels are burned, the original captured and stored carbon is released back to the atmosphere as CO_2 and other carbon-based gases. In addition, when forests or other terrestrial ecosystems are disturbed through

harvesting, conversion, or natural events such as fires, some of the carbon stored in the soils and organic matter, such as stumps, snags, and slash, is oxidized and released back to the atmospheric pool as CO_2. The amount released varies, depending on subsequent land use and probably rarely is more than 50% of the original soil store (Salwasser, 2006). As forests become older, the amount of carbon released through respiration and decay can exceed that taken up in photosynthesis, and the total accumulated carbon levels off. This situation becomes more likely as timber stands grow overly dense and lose vigor. Wildfires are the greatest cause of carbon release from forests. At the global scale, if more carbon is released than is captured and stored through photosynthesis or oceanic processes, the concentration of carbon dioxide (CO_2) builds in the atmospheric pool. However, the greatest changes in forest sequestration and storage over time have been due to changes in land use and land use cover, particularly from forest to agriculture. More recently, changes are due to conversions from forest to urban development, dams, highways, and other infrastructure (Malmsheimer, Heffernan, Brink, et al.).

Alternative 1

Direct Effects:

The proposed harvest operations associated with the Proposed Action would result in a release of carbon and reduce carbon storage in the forest both by removing organic matter (trees) and by increasing heterotrophic soil respiration. However, much of the carbon that is removed is offset by storage in forest products. Forest management that includes harvesting provides increased climate change mitigation benefits over time because wood-decay CO_2 emissions from wood products are delayed (Malmsheimer, Heffernan, Brink, et al.). Prescribed burning activities, although a carbon neutral process, would release CO_2, other greenhouse gasses (GHG), and particulates into the atmosphere. However, implementing the proposed prescribed burns would reduce fuel loading and would be expected to reduce fire intensity and severity as well.

Indirect Effects:

Indirectly, implementation of the proposed actions would increase the overall health, vitality, and growth within the project area, reduce the susceptibility to insects and disease, as well as reduce fuel accumulations and lower the risk for a catastrophic wildfire from occurring in the project area. This would serve as a way to increase carbon storage within the project area and mitigate carbon accumulation in the atmosphere.

Cumulative Effects:

As GHG emissions and carbon cycling are integrated across the global atmosphere, it is not possible to determine the cumulative impact on global climate from emissions associated with this project or any number of projects. It is not expected that the effects of this project or multiple projects can be specifically attributed to the cumulative effects on global climate change.

Alternative 2

Direct Effects:

No management activities would occur under this Alternative, therefore no direct effects on greenhouse gas emissions and carbon cycling would occur.

Indirect Effects:

Because no management activities would take place under this alternative, carbon would continue to be sequestered and stored in forest plants, trees, (biomass) and soil. Unmanaged, older forests can become net carbon sources, especially if probable loss due to wildfires are included (Malmsheimer, Heffernan, Brink, et al.). In the absence of prescribed fire, fuel loadings would continue to increase and accumulate on the forest floor. In the event of a wildfire, fuel loading would be higher, increasing the risks of catastrophic damage to natural resources. This would result in a large release (pulse) of GHG and carbon into the atmosphere. By deferring timber harvest activities, the forests would continue to increase in density. Over time, this could pose a risk to density dependent mortality, insects, and disease. This could result both in a release of carbon from tree mortality and decomposition as well as hinder the forest's ability to sequester carbon from the environment because live, vigorous stands of trees have a higher capacity to retain carbon.

Cumulative Effects:

As GHG emissions and carbon cycling are integrated across the global atmosphere, it is not possible to determine the cumulative impact on global climate from emissions associated with this project or any number

of projects. It is not expected that the effects of this project or multiple projects can be specifically attributed to the cumulative effects on global climate change.

E. VISUAL QUALITY

Existing Condition

The Prairie project area is generally bounded geographically by Dooley Branch and Snake Branch to the north, the forest property boundary to the east, Yell County Road 36 (Spring Lake Perimeter Road) to the west and the forest boundary to the south. This area will be used as the analysis area for visual quality.

The analysis area is located in a rural area that is mostly forested land with some interspersed private land. The predominate tree species is shortleaf pine with eastern red cedar, loblolly pine and hardwood species.

Visual quality within the Ozark–St. Francis National Forests is measured and managed through the use of the Scenery Management System. This system uses scenic integrity as a measure of the degree to which a landscape is visually perceived to be "complete." The highest scenic integrity ratings are given to those landscapes, which have little or no deviation from the character valued by constituents for its aesthetic appeal. Scenic integrity is used to describe an existing situation, standard for management, or desired future conditions.

Three of the four categories of Scenic Integrity Objectives (SIO) listed in the Ozark-St. Francis Land and Resource Management Plan (LRMP, p. G-4) occur in the compartments (see Scenic Integrity Objective Map on page 99). They are as follows:

> High – (Appears Unaltered) Scenic integrity refers to landscapes where the valued landscape character "appears" intact. Deviations may be present but must repeat the form, line, color, texture, and pattern common to the landscape character so completely and at such scale that they are not evident.
>
> Moderate – (Slightly Altered) Scenic integrity refers to the landscapes where the valued landscape character "appears slightly altered." Noticeable deviations must remain visually subordinate to the landscape character being viewed.
>
> Low – (Moderately Altered) Scenic integrity refers to landscapes where the valued landscape character "appears moderately altered." Deviations begin to dominate the valued landscape character being viewed but they borrow valued attributes such as size, shape, edge effect and pattern of natural openings, vegetative type changes, or architectural styles outside the landscape being viewed. They should not only appear as valued character outside the landscape being viewed, but also compatible or complimentary to the character within.

Landscape viewing can be subdivided into distance zones for classification, analysis, and simplification of inventory data. Distance zones are defined as: immediate foreground (0' to 300'), foreground (300' to ½ mile), middle ground (1/2 mile to 4 miles), and background (4 miles to horizon).

There are no natural features, such as overlooks, viewpoints or balds which would provide a sweeping view of this project area. Visual impacts that would be visible to the public and which could be objectionable are limited to those which are located along County Rd.36, paved roads within the developed Spring Lake Recreation facility and designated off-highway vehicle (OHV) trails.

The project area may be viewed from a variety of locations along County Road 36 (FDR 1602/Spring Lake Road) paved roads within the developed Spring Lake Recreation facility. These roads pass through areas designated as Scenic Integrity High.

FDR 1640, 1640A, 1618A and 1625 are designated OHV routes and as a result are more sensitive to visual impacts than would otherwise be the case since a primary purpose of OHV recreation is viewing scenery. These roads pass through areas designated as Scenic Integrity High.

The remaining roads within the project area are not considered visually sensitive.

Effects

Alternative 1

The project would create temporary visual impacts in the area by opening stands through the application of regeneration harvest and thinning. There would be temporary evidence of harvest activity as seen from County Road 36 (Spring Lake Road), FDR 1640, 1640A, 1618A, 1625, and paved roads within the developed Spring Lake Recreation facility.

Visual effects would be reduced by the application of the appropriate mitigation measures starting on page 27. Additionally, within one season, leaf fall and re-growth of vegetation would assist in masking management activities from major travel routes. Temporary browning from slash and dead tops left from unused portions of harvested trees may be initially evident; however, mitigation measures for dealing with slash and dead tops left from harvest would be implemented along County Rd 36 (Spring Lake Rd) roadways and designated OHV travel routes as described on page 27.

Site preparation and release with herbicides would create a browning then a graying effect that can last from one to several seasons or years. Visual effects from this disturbance would fade quickly.

Temporary roads created during the sale would be blocked and seeded after the sale. Visual effects from this disturbance are not considered noteworthy and are a common part of the landscape in the area of the project.

Prescribed burning across the project area is proposed in a variety of stands with different levels of visual concern. These stands have SIOs of High, Moderate, and Low. Evidence of prescribed burning in the understory would be apparent along OHV routes County Road 36 (Spring Lake Road) and paved roads within the developed Spring Lake Recreation facility. Some understory vegetation would be temporarily removed or blackened but would begin to sprout back within the next growing season. Periodic burning would be implemented to enhance and maintain the newly opened part of the forest to be treated by thinning and seed tree removal. A park-like appearance, allowing views into forest, should result from these actions as well as promoting numerous flowering plants and a variety of flowering tree species. Visual diversity of species, color and texture of vegetation would be enhanced with this activity. Negative effects on the visual resource from prescribed burning would be temporary. The changing of the shrubby understory vegetation to an herbaceous understory would be visually beneficial.

Active management of the forest within the travel corridors is desirable for visual management and the short-term impacts of vegetation management may be mitigated through careful application of mitigation techniques adopted by the Forest Service and specifically tailored for use in Southern forests. The Forest Service would apply the Regional Standards from the Scenery Treatment Guide (matrix) for Southern Forests (U.S. Department of Agriculture – Forest Service, 2008) for visual impact mitigation based upon the Scenic Integrity Objective of the area and the specific vegetative treatment selected for the area. For roads that are constructed or reconstructed that are to remain open, mitigation including not leaving high stumps near the roadway, chipping of tops and slash left over from the treatment, pulling back large slash away from the roadway, and reseeding of disturbed roads shoulders with an erosion control seed mix would be implemented. Another measure from the Regional Standards is to use prescribed fire to reduce left over slash. All harvest areas are proposed for prescribed burning.

All activities proposed would meet Scenic Integrity Objectives by applying appropriate mitigation measures.

Alternative 2

Views from County Road 36 (Spring Lake Road), FDR 1640, 1640A, 1618A, 1625, and paved roads within the developed Spring Lake Recreation facility would continue to change as a result of natural processes. Natural processes would continue to create openings. Tree growth would slow and visual penetration into stands would continue to be diminished. Blooming of understory trees such as dogwood and native ground dwelling plants would become less evident.

F. RECREATION

Existing Condition

The analysis area for recreation is the area included in Compartments 1, 14, 55 and 56.

The western edge of Compartments 1 and 14 contain Spring Lake Recreation Area. The majority of the developed day use and campground area is located in Compartment 1 Stands 9 and 13. Spring Lake Recreation Area is a 60-acre developed recreation facility adjacent to an 82-acre lake located in a mountain setting. It is popular for picnicking (19 family units) and camping (13 family units) as well as swimming and fishing.

Tourism within the project area is generally restricted to visitors whose destination is Spring Lake, OHV trial users, visitors driving for pleasure and hunters.

Recreationists currently use open roads, designated OHV routes, and non-designated trails within the analysis area for access to hunting locations, horseback riding, mountain bike riding and dispersed camping. Horseback riders also use closed roads and the general forest within the analysis area. Approximately 3.25 miles of existing OHV trail is located in the analysis area on open forest roads.

Hunting for whitetail deer and eastern wild turkey is a popular recreational activity in this area. Limited hunting of squirrel and quail also occurs. Dispersed hunter camps are located throughout these compartments.

Several wildlife ponds are located in the project area but do not provide for fisheries.

The Recreation Opportunity Spectrum (ROS) provides a framework for defining classes of outdoor recreation opportunity environments (U.S. Department of Agriculture – Forest Service, 1986). There are six ROS designations ranging from primitive to urban classifications. The analysis area contains two of these designations: Roaded Natural (RN) and Semi-Primitive Motorized (SPM).

The following defines these ROS designations:

- Roaded Natural (RN) settings are located within a half mile of a road and usually provide higher levels of development such as campgrounds, picnic areas, and river access points.

- Semi-Primitive Motorized (SPM) settings are characterized by a naturally appearing environment. Concentration of users is low. Motorized use is permitted.

Objectives of trail management provide trails that meet their Trail Management Objectives (TMOs), are consistent with the applicable land management plan, provide opportunities for satisfying recreation experiences, harmonize with and provide opportunities for enjoyment of the national forest or grassland setting, and minimize maintenance costs.

TMOs include travel management strategies. There are two categories ranging from allowed to restricted uses of the trail system. Allowed includes what the trail is managed for, what is an accepted use and what is discouraged. Restricted includes what is eliminated or prohibited along the trail system.

Managed use of the OHV Trail within the project area is categorized as accepted use. Accepted uses on OHV trail in the project area is for wheeled OHVs equal to or greater than 50 inches in width.

Effects

Alternative 1

Applying mitigation measures as discussed in the Visual Quality section of this EA would reduce effects from the proposed treatments.

During harvesting, signs would be posted to caution road users and recreationists of logging activities occurring in the area. Slow moving vehicles and heavy equipment may delay people driving for pleasure, hunters, campers, horseback riders, OHV users, and local residents.

During harvest operations, the evidence of human activity in the area would increase due to the activity associated with logging. This activity may temporarily displace hunters and other recreationists. Following harvest, logging activities and equipment would leave the area and disruption would cease.

Approximately 3.4 miles of OHV route would be added to the existing OHV trail system.

Firewood gathering opportunities would increase following the timber sale.

Prescribed burning for site preparation and/or wildlife habitat improvement/fuels reduction is proposed within the project area. The temporary charred appearance of the stands after prescribed burning is accomplished may detract from the recreation experience of users. This charred appearance would be progressively less evident over one to two seasons.

Hunting is a popular recreational activity as mentioned above. Habitat capacity for game species such as deer and turkey are increased for this alternative due to the proposed activities such as wildlife opening construction, enlargement, and restoration. Hunting opportunities are expected to increase as well. Visual penetration into stands would improve after harvesting, which may benefit hunters in spotting game animals.

Temporary road construction, road maintenance, road realignment, and road reconstruction would improve access for hunters, OHV and horseback riders. Following timber sale activities, temporary roads would be closed and returned to forest production. This would eliminate access provided by these roads, but the effect would be minimal since these roads did not exist prior to the timber sale.

Road closure and road decommissioning may detract from the hunting experience of some hunters who cannot or prefer not to walk. Road closures and road decommissioning could enhance some hunters' experiences that prefer solitude while hunting. The area would still be available to hunt by means other than motorized access. Road closures and road decommissioning would serve to protect wildlife from vehicular disturbance and provide additional wildlife food sources. The area would still be available to hunt by means other than motorized access.

Road closure and road decommissioning of existing system roads may detract from dispersed OHV use, travel by horseback riders, and those driving for pleasure within the analysis area.

Road construction and road closures would not have an impact on recreation uses of this area.

All activities proposed would meet ROS designations by applying appropriate mitigation measures.

All activities proposed would meet TMO designations by applying appropriate mitigation measures.

Alternative 2

Views from County Road 36 (Spring Lake Road), FDR 1640, 1640A, 1618A, 1625, and paved roads within the developed Spring Lake Recreation facility would continue to change as a result of natural processes. Natural processes would continue to create openings. Tree growth would slow and visual penetration into stands would continue to be diminished. Blooming of understory trees such as dogwood and native ground dwelling plants would become less evident.

G. HERITAGE RESOURCES

Existing Conditions

A cultural resource review and inventory was conducted during the planning process for this proposed project to identify historic properties. The findings of this survey were reported to the Arkansas SHPO and Tribal partners as Project No. 13-10-06-01. The Arkansas SHPO concurred that the project would have no adverse effect on historic properties provided that recommended mitigation measures provided in the report and described therein are followed (Concurrence letter dated 5/13/13, PN 13-10-06-01, AHPP Tracking No. 85862).

Known Cultural Resources: Forty-eight archeological sites have been identified in or near the Project Area as a result of cultural resources inventory surveys. One site is listed on the National Register of Historic Places, and four sites are recommended eligible for nomination. Thirty-two sites have been recommended

ineligible for listing. Eligibility recommendations for the remaining ten sites are undetermined, and these require additional field and/or archival research before a recommendation can be made.

Sites listed on the National Register of Historic Places, recommended eligible for nomination, and with undetermined eligibility will be protected from effects of activities proposed by this project. Mitigation measures are discussed in detail in Chapter 2.

The Spring Lake Recreation Area Historic District was listed on the National Register of Historic Places in September 1995. This area was developed by the Works Progress Administration (WPA) as a recreation area in the mid-1930s. Its original structures were designed in the Rustic or Rustic Resort style that was typically the signature of Civilian Conservation Corps (CCC) construction. The historic district includes 22 contributing resources (two swimming platforms, a bathhouse, two picnic pavilions, a dam, 14 rock-constructed picnic sites, a stone bridge, and the 86-acre lake itself). A number of WPA-constructed landscape features are included within this district and should be considered contributing resources, although not specifically included within the scope of the original survey and in the count of 22 listed above (Story 1993).

The architecture within the Spring Lake Recreation Area is one of the few known examples, and one of the best, of an original ensemble of Rustic-style buildings constructed by the WPA. The design is distinctly reminiscent of the Rustic style that is the trademark of the CCC. While it is possible that men working for the WPA may have been directed by construction supervisors and architects already familiar with typical CCC construction, there is no surviving documentation that directly connects either the CCC or the Resettlement Administration to the Spring Lake WPA project (Story 1993).

Sites recommended eligible for nomination for listing include three historic sites (Stafford Cemetery and two cattle dipping vats) and two prehistoric sites from which diagnostic lithic materials have been recovered.

Distribution of sites by National Register eligibilities and site types is summarized below:

Table 10: **Summary – National Register Eligibilities by Site Types**

NR Eligibility	Site Types: Historic	Prehistoric	Multi-Component	Total
Listed	1			1
Eligible	3	2		5
Not Eligible	27	5		32
Undetermined	10			10
Total	41	7		48

There may be American Indian sacred sites or landscapes currently unknown to the Forest. The Forest will continue to consult with our Tribal partners to ensure that American Indian sacred sites and landscapes are identified, assessed, and considered in project planning and implementation.

Effects Analysis

The scope of the analysis for potential effects to cultural resources includes the entire project area and considers the proposed activities within treatment areas, as well as access to these areas.

An effect to a cultural resource is the "…alteration to the characteristics of a historic property qualifying it for inclusion in or eligibility for the National Register." (36 CFR 800.16(i)) Any project implementation activity that has potential to disturb the ground has potential to directly affect archeological sites, as does the use of fire as a management tool. Specific activities outlined in the project that have potential to directly affect cultural resources include timber harvesting and associated log landings, skid trails, and temporary roads, prescribed burning and associated fireline construction, road maintenance or reconstruction where ground disturbance takes place outside existing right-of-way area, and pond construction for wildlife water source.

Proposed activities that do not have potential to affect cultural resources, and therefore, are not considered undertakings for purposes of this project include: Non-commercial thinning, timber stand improvements, on-going maintenance of existing Forest roads or reconstruction of previously surveyed roads where ground disturbance does not take place outside existing road prisms and existing drainage features, rehabilitation/closure of temporary roads, log landings, and skid trails using non-ground disturbing methods, road decommissioning using non-ground disturbing methods, and non-native invasive plant species control using non-ground disturbing methods.

In general, proposed project activities have the potential to affect cultural resources by encouraging increased visitor use to those areas of the Forest in which cultural resources are located. Increased visitor use of an area in which archeological sites are located can render the sites vulnerable to both intentional and unintentional damage. Intentional damage can occur through unauthorized digging in archeological sites and unauthorized collecting of artifacts from sites. Unintentional damage can result from such activities as driving motorized vehicles across archeological sites, as well as from other activities, principally related to dispersed recreation, that lead to ground disturbance. Effects may also include increased or decreased vegetation on protected sites due to increased light with canopy layer reduction outside of the protected buffer.

Alternative 1
Proposed access changes, soil restoration work, and opening of forested areas resulting from timber harvest can impact cultural resources. Improved access and visibility to the forest landscape increases the potential for damage from natural and human action (i.e. erosion, impacts of illegal or inappropriate OHV usage, and looting).

Project components with potential to directly affect archeological sites primarily include timber, prescribed fire, road management, and some wildlife management activities. However, if the prescribed mitigation measures discussed in Chapter 2 are properly implemented, project activities would not be expected to adversely affect cultural resources.

Cumulative Effects
The greatest risks for archeological sites on the Forest come from unmanaged and unmonitored resources. Planned management and restoration activities benefit the cultural landscape by controlling intrusive vegetation, excessive accumulation of fuel load and risk of wildfire, and managing recreational use (i.e. dispersed campsites, OHV usage of roads and trails). The federal presence that results from the implementation of project activities would be expected to benefit cultural resources over time by increasing opportunities for the monitoring of sites for looting and vandalism, thus assisting with enforcement of federal protection laws.

Alternative 2
In general, archeological surface and subsurface site integrity is subject to adverse effects that may result from the buildup of hazardous fuels and lack of forest management. These increase the potential for wildfire occurrence, intensity, and tree mortality. Fires occurring in areas with dense concentrations of combustible material have the potential to burn with greater than normal intensity and duration, potentially altering the physical integrity and/or research value of the archeological record. Resulting soil exposure can lead to increased erosion, potentially disturbing or resulting in a loss of archeological soil matrices and/or site components. With the No Action alternative, historic properties would continue to degrade.

Cumulative Effects
Although the no action alternative would eliminate risk of inadvertent effects to cultural resources from planned activities, it would result in a marked increase in potential damage from unmanaged and unmonitored resources. Intrusive vegetation would not be controlled. Fuel load would accumulate, and the risk of uncontrolled fires, potentially damaging to cultural resources, would increase. The lack of federal presence in the area could be expected to increase the potential for damage to cultural resources from looting, vandalism, and other illegal or unmanaged use of the Forest.

H. MINERALS

Existing Condition

This project would not approve any wells and does not evaluate any gas well proposals. This information is intended to provide background for possible gas well development. Any proposal would be fully evaluated when received. The project area is all in Yell County. Management Areas consist of Pine Woodland, Mixed Forest and a Developed Recreation Area. The majority of the project area is under lease for gas exploration at this time. This area is in the B-44 Field, established by the Arkansas Oil and Gas Commission (AOGC) and recognized by the Bureau of Land Management (BLM). The area leased around Spring Lake has either a No Surface Occupancy (NSO) or Controlled Surface Occupancy (CSO), meaning that the surface area around the lake has stipulations in place to prevent disturbance or set time frames for activity.

There are currently no mineral proposals for this project area. No Notice of Stakings (NOS) or Applications for Permit to Drill (APD) have been received as of February 2013. There are producing wells approximately two miles south of the project boundary off of the forest. These are the closest producing gas wells.

The Mt. Magazine Ranger District has about 40 producing gas wells. There are numerous producing wells on private land within the forest boundary. Gas production is driven by economic forces. At this time, natural gas prices are depressed leaving little incentive for further drilling. It should be expected, that as economic conditions change for the industry, that general development would increase. This project area would be considered exploratory, thus having a lower probability of activity. Producing wells and infrastructure are close enough that it is reasonable to expect exploratory activity at some point in time.

Effects

Alternatives 1 and 2

Requests for surface occupancy through an APD to withdraw minerals that are legally entitled to the leaseholder within the project area would be approved according to the President's Energy Initiative through all pertinent laws. Prior to approval, an on-site with the operator, BLM, and Forest Service specialists would take place. All relevant aspects would be evaluated, these may include; visuals, air quality, noise levels, water quality, pad, road and utility placement, construction standards, and Best Management Practices all addressing environmental concerns as well as the operator's right to enter for mineral withdrawal under the lease. The rehabilitation of areas would be done in a timely manner with direction given individually for each site.

If a well is deemed a producer, per BLM and AOGC, a gathering pipeline would be needed to connect the gas well to an existing transmission pipeline. These gathering pipelines would generally be buried within or parallel to an existing road or utility corridor.

APDs received would be evaluated on their own merit to minimize impacts to the area, including cumulative impacts. Whenever possible, the existing access roads and gas pipelines would be utilized by multiple drilling areas. This is the practice that has been followed in the past and reduces the number of linear miles of roads and pipelines on the ground. As wells become depleted, thus unprofitable, they are generally plugged by the producer, at which time the area is rehabilitated to meet Forest Service standards.

Cumulative effects to vegetative resources from potential future gas well development in the area would be from conversions of small areas of forest to semi-permanent openings. Each new gas well would require native vegetation to be removed creating an opening of three to five acres, depending on topography and well requirements. Following the drilling process the opening would be reclaimed down to a smaller size required for production or plugged and reclaimed if not producible. The life span of each individual location may vary from a dry hole to approximately 40 years.

In following the President's Energy Initiative, the Forest Service must continue to honor access to the minerals under existing leases and look at potential areas that can environmentally accommodate additional leases.

I. TRANSPORTATION

Existing Condition

There are approximately 23.0 miles of existing roads in the analysis area for transportation that consists of stands included in Compartments 1, 14, 55, and 56. Approximately 8.4 miles of these roads are currently closed. Appendix C, Transportation System, displays the road numbers, mileage, and status for existing roads.

Two Roads Analysis Reports (RAPS) were completed for this project (U.S. Department of Agriculture Forest Service, 2005). The Prairie Project lies mainly within two main watersheds, Prairie Creek and Spring Creek. The combined acreage of these watersheds within the analysis area is 4841 acres (approximately 92% of the analysis area) and is located in the Arkansas River watershed (map located in project file). There are two other watersheds within the analysis area, Upper and Lower Chickalah Creek. Both watersheds are located in the East to Southeast portion of the analysis area. Total acres within these watersheds in the project area is approximately 422 acres. There is only approximately 0.25 mile of roads within the Upper Chickalah watershed. These road sections were analyzed within the Spring Creek and Prairie Creek watersheds. There are no roads located in Lower Chickalah Creek watershed within the analysis area. Therefore, this analysis focuses on the two main sub-level watersheds (6^{th} order) within the Petit Jean Watershed. The Prairie Project is approximately 8.5% of the combined watershed acres. Within these sublevel watersheds, Level 1-5 roads and unclassified roads were assessed to determine the future road network. Findings from this analysis were used in developing transportation needs for the Prairie Project.

FDR 1602A, 1618A, 1625, 1632, 1632C, 1639, 1640, 1640A, 96001C, 96001D and Spring Lake Road are open to the public for travel. Over recent years, these roads have become in need of maintenance. They suffer from a lack of surface aggregate, areas of weak sub-grade, poor drainage, and encroachment of woody vegetation into the roadway.

FDR 1602B, 1625A, 1632A, 1632B, 1632C, 1640, 96001A, 96001B, 96001F, 96014A, 96014B, 96055D, 96055F, and 96055G are closed to motorized travel and receive no annual maintenance. Over past years, these roads have become overgrown with vegetation and are in need of some aggregate placement and drainage improvements to support timber management activities.

FDR 1602A and 1602AR are roads within the Spring Lake Receration Area. These roads are open from Memorial Day to Lador Day and Closed Labor Day to Memorial Day. Both of these roads are asphalt and are in good condition.

FDR 1625, 1632, 1632C, 1640, 1640A, 96014B and Spring Lake Road are in need of reconstruction to withstand traffic associated with timber harvesting.

Field visits were made documenting the current condition of closed roads and roads proposed to be closed. This documentation is part of the process file.

Appendix C shows a listing of open and closed roads within the project area. Certain roads within the project area are no longer needed for management in the near future. Their continued use by the public creates an unfavorable situation for wildlife through unnecessary disturbance and adds to soil loss through erosion.

Effects

Alternative 1

Temporary road construction would provide access to harvesting areas during the timber sale. These roads would be blocked and seeded once the sale is completed.

Approximately 4.2 miles of open roads would receive maintenance. These roads are FDR 1632C, 1639, 1618A, and 96001C. Road maintenance would be performed as needed so to maintain or improve the road in no less than the same condition that existed prior to timber activity. Maintenance may consist of brushing of roadsides, removal or repair of minor slides or slumps, cleaning of roadside ditches and drainage devices, spot aggregate placement, and blading of the travel way. All disturbed areas would be mulched and seeded along with the use of hay bales for erosion control where needed.

Portions of FDR 1632B, 1639 and 96014B are closed roads that would receive maintenance during timber harvesting. Maintenance activities on these approximate 1.3 miles of road would be as described above. Once these activities are complete, these roads would be re-closed and seeded to reduce erosion and serve as linear wildlife openings.

Reconstruction of approximately 4.7 miles of Spring Lake Road would result in improvement or realignment of the existing roadway. This activity would involve but not be limited to clearing the existing vegetation back to daylight the road, replacement of failing drainage structures such as culverts and adding additional structures to facilitate drainage. Geotextile and oversize aggregate may be added to improve the bearing strength of the sub-base. Borrow material would be used when needed to raise the road grade and to cover exposed rock. The travelway would be resurfaced with gravel. All disturbed areas would be mulched and seeded along with the use of hay bales for erosion control where needed.

Approximately 5.2 miles of FDR 1625, 1632, 1632C, 1640 1640A, and 96014B would be reconstructed to withstand traffic associated with timber harvesting. Road reconstruction would be performed as described above for Spring Lake Road.

During road maintenance and road reconstruction, some road/stream crossings may be replaced to improve aquatic organism passage. These replacement crossings would allow for passage of all aquatic species.

An additional 0.6 miles would be constructed and would receive number FDR 96001E. This would be constructed to provide access for timber harvesting. Once harvesting is complete, this road would be closed. Construction would consist of clearing and grubbing, constructing natural drainage crossings; v, wing, and lead-off ditches; rolling dips; and installing culvert pipes where nessary. Borrow material would be used as needed to raise the road grade and cover exposed rock. All or part of the road would be surfaced with crushed aggregate. All disturbed areas would be seeded and mulched along with other erosion control measures. Long-term funding obligations have been considered concerning the addition of this road to the transportation system, consistent with direction provided in Forest Service Manual 7700 (U.S. Department of Agriculture – Forest Service, 2009). Through a variety of appropriations and trust fund collections, the Mt. Magazine Ranger District has historically been able to perform maintenance on roads that are constructed.

FDR 1632C and 96001F would become open roads. This would provide additional access for the public.

In an effort to reduce system road miles within this project area roads that are currently closed and are no longer needed as systems roads all or part of these roads would be decommissioned. These roads are FDR 1625A, 1632A, 1632B, 1639, 96014A, 96014B, 96055D, 96055F, and 96055G totaling approximately 5.2 miles.

All or part of the alterative 1 would be implemented based on revenues received from the timber sold from the project area.

See Appendix C, for current status and proposed future status of roads within this project area.

Alternative 2
No new road work would be done. Only those roads with a current maintenance agreement would receive maintenance. Roads without a maintenance agreement would continue to deteriorate. Roads that are proposed for decommissioning would not be decommissioned Current road closures would remain. No additional roads would be closed or opened.

J. VEGETATION

Existing Condition

The analysis area for vegetation is stands included in Compartments 1, 14, 55, and 56.

The project area is in Management Area 3.A (Pine Woodland), Management Area 3.C (Mixed Forest), and Management Area 3.I (Riparian Corridors). These management areas are classified as suitable for timber management (LRMP, pgs. 2-56, 2-61, and 2-74).

The Forest Type Map on page 95 displays the distribution of forest cover types by pine and hardwood types.

Table 10 illustrates the acreages of different age classes in the forested acres in these compartments. The surrounding compartments are similar in age class distribution to these compartments.

Table 11: Acreage in Each Age Class (as of 2011) by Forest Type.

Age Class	% Total Acres	Pine-Pine/Hardwood Acres	Hardwood-Hardwood/Pine Acres
0 - 10	0%	0	0
11 - 20	5%	248	0
21 - 40	20%	899	0
41 - 70	37%	1680	12
71 -100	25%	822	301
100+	12%	550	0
	TOTAL	**4199**	**313**

Stands in which at least 70% of the dominant and codominant crowns are either pine species or hardwood species are classified as such. Stands in which 51-69% of the dominant or codominant crowns are either pine species or hardwood species are classified as mixed pine/hardwood or mixed hardwood/pine stands.

The project area has a dominant cover made up of even-aged stands, ranging from 15-105 years of age (in 2011). See page 97 for the Age Class Distribution Map. The pine type age classes in this analysis area are not in balance. Approximately 75% of the pine and pine/hardwood type acres are in the 41-70, 71-100 and 100+ year old age classes.

Appendix A contains a Stand Map (page 99) for these compartments.

Table 13 shows the current stand conditions for stands in the project area. All but one stand are proposed for some type of activity ranging from harvesting, site preparation, wildlife habitat improvement/fuel reduction prescribed burning, etc. The one stand not proposed for treatment is a research stand. This stand has ongoing research activities. See Table 2 for a list of proposed actions.

The following codes are used to describe the forest type and condition of the stands within the project area:

Table 12: Forest Type and Condition Class.

Forest Type		**Condition Class**	
12	Shortleaf Pine/Oak	05	Sparse Poletimber
31	Loblolly Pine	06	Sparse Sawtimber
32	Shortleaf Pine	07	Low Quality Poletimber
43	Oak-Eastern Red Cedar	08	Low Quality Sawtimber
47	White Oak/Black Oak/Yellow Pine	10	Mature Sawtimber
48	Northern Red Oak-Hickory-Yellow Pine	11	Immature Poletimber
51	Post Oak/Black Oak	12	Immature Sawtimber
53	White Oak/Red Oak/Hickory	13	Adequately Stocked Seedling/Saplings
		16	Multi-storied Stand

Table 13: Current Stand Condition.

Compartment	Stand	Acres	Forest Type/ Condition Class	Age	Pine Basal (ft^2/acre)	Hardwood Basal (ft^2/acre)	Site Index
1	1	82	3210	101	119	30	65
1	2	39	1212	64	95	65	60
1	3	56	3210	103	83	40	70
1	4	156	3212	57	83	31	70
1	5	49	3212	61	84	25	70
1	6	42	3212	46	113	15	60
1	7	44	3211	15	37	47	65
1	8	56	3212	58	82	9	70
1	9	75	3210	91	107	65	70
1	10	59	3210	75	52	63	70
1	11	12	5310	70	9	115	65
1	12	49	3210	70	58	6	80
1	13	23	3212	58	93	17	70
1	15	70	3205	19	6	8	60
1	16	64	3205	25	32	25	65
1	17	71	3211	24	172	0	70
1	18	20	5310	81	45	65	70
1	19	77	4308	81	13	27	50
1	20	34	3211	36	120	0	65
1	22	72	3210	103	74	30	70
1	23	36	3210	103	53	31	70

Table 13. Current Stand Condition, continued.

Compartment	Stand	Acres	Forest Type*/ Condition Class	Age	Pine Basal (ft^2/acre)	Hardwood Basal (ft^2/acre)	Site Index
14	1	69	3210	82	96	17	60
14	2	32	4708	83	7	80	60
14	3	130	3210	101	86	33	60
14	4	16	3211	42	37	40	60
14	5	76	3210	97	103	27	70
14	6	24	4707	96	53	33	60
14	7	93	3211	46	122	14	70
14	8	44	3212	51	76	20	60
14	9	67	3211	35	100	20	60
14	10	115	3210	94	130	24	70
14	11	32	3212	55	70	7	70
14	12	36	3212	59	70	53	60
14	13	75	1206	85	53	34	60
14	14	62	3211	24	139	0	70
14	15	77	3111	25	110	3	70
14	16	74	3210	101	117	17	70
14	17	22	4808	93	13	88	60
14	18	55	3216	20	64	22	70
14	19	58	3111	25	155	5	70
14	20	45	3111	25	138	3	70
14	21	71	3111	25	119	0	70
14	22	37	3210	106	106	26	70
14	24	33	3213	16	43	5	70
14	25	30	3210	93	85	30	70

Table 13. Current Stand Condition, continued.

Compartment	Stand	Acres	Forest Type*/ Condition Class	Age	Pine Basal (ft^2/acre)	Hardwood Basal (ft^2/acre)	Site Index
55	1	34	3212	41	80	3	74
55	2	14	3212	69	107	0	67
55	3	34	3212	51	80	8	80
55	4	67	3211	25	125	4	79
55	5	169	3212	50	73	13	70
55	6	63	3210	103	69	26	70
55	7	88	3212	57	82	21	65
55	8	51	3210	96	64	22	65
55	9	144	3211	42	82	12	62
55	10	71	3211	24	66	0	60
55	11	7	3211	38	105	10	60
55	12	72	3210	96	83	14	70
55	13	60	3211	24	63	3	60
55	14	65	3210	93	78	19	70
55	15	44	3211	25	95	13	70
55	16	36	3210	93	100	33	70
55	17	74	3210	96	97	11	70
55	18	46	3211	15	22	2	70
55	19	37	5107	93	80	5	60
55	23	25	3210	96	63	17	70

Table 13. Current Stand Condition, continued.

Compartment	Stand	Acres	Forest Type*/ Condition Class	Age	Pine Basal (ft^2/acre)	Hardwood Basal (ft^2/acre)	Site Index
56	1	15	3211	23	120	0	74
56	2	118	3212	51	109	13	72
56	3	39	3212	48	144	4	71
56	4	25	3111	24	228	0	71
56	5	144	3212	47	116	3	71
56	6	15	3111	24	220	0	70
56	7	39	3212	59	98	6	62
56	8	63	5308	81	7	67	70
56	9	48	3212	48	164	8	61
56	10	20	3211	37	120	18	70
56	11	15	3211	40	127	10	68
56	12	176	3212	47	76	4	72
56	13	15	5308	81	7	53	74
56	14	11	5308	81	7	120	78
56	15	11	3211	32	78	13	67

The mid-story and ground vegetation components and densities in these stands are typical of those found in the cover types of the area. The species composition in the mid-story consists of oak, hickory, dogwood, persimmon, sassafras, sweetgum, locust, blackgum, elm, pine, redcedar, and red maple. Common shrubs and vines found include French mulberry, hawthorns, blueberries, viburnums, greenbriers, blackberry, honeysuckle, and grape. Grasses and other herbaceous vegetation in the understory include bluestem, foxtail, nutsedge, poison ivy, greenbrier, Desmodium, and panicums.

Shading due to canopy closure and buildup of duff or needle layers is reducing or possibly eliminating grasses and forbs in the majority of the analysis area.

In the analysis area, the fire ecosystem currently falls into the Condition Class II category. Condition Class II fire regimes have been moderately altered from their historical range. The risk of losing key ecosystem components is moderate. Fire frequencies have departed from historical frequencies by one or more return intervals (either increased or decreased). This historical fire regime results in moderate changes to one or more of the following: fire size, intensity, and severity, and landscape patterns. Vegetation attributes have been moderately altered from their historical range. Where appropriate, these areas need moderate levels of restoration treatments, such as fire use and hand or mechanical treatments, to be restored to the historical fire condition class.

In this analysis area, approximately 1412 acres (33% of project acres) are located within the Wildland Urban Interface (WUI). WUI areas are National Forest land that is within one-quarter of a mile from private land. These areas are at risk of a wildland fire that may occur within the National Forest lands that border these private lands. They are a priority for wildfire fuel reduction treatments due to the lives and property that need to be protected.

Introduction of non-native invasive species has altered native vegetation. Sericea lespedeza, *Lespedeza cuneata*, is a non-native invasive plant that has become well established throughout the district. Sericea has become the dominant roadside species along many forest roads, including roads within the project area.

Some sites of privet have been noted within the project area.

Effects

Alternative 1
Shelterwood cutting is generally accepted within the scientific community as being an appropriate regeneration harvest cutting method for shortleaf pine when establishment of an even-aged stand is the desired future condition (Baker, 1991). Shelterwood cutting would utilize the seed source already in place. These stands have seedtrees that are of good quality and form and distribution of sawtimber trees is uniform across the stands. Past experience on the Mt. Magazine District has shown that stands with an adequately distributed number of well-formed sawtimber trees with good seed carrying capacity provide a sufficient number of seedlings to meet stocking requirements. However on occasion, natural regeneration fails due to poor seed catch, drought or some other ecological reason. On these occasions when natural regeneration fails to achieve minimum stocking requirements (150-300 trees per acre depending on site index) as described in the RLRMP. Shortleaf pine seedlings would be planted at a density of 680 trees per acre to reach the target level of 500-700 trees per acre following third-year stocking checks as indicated in the RLRMP.

The desired future condition of these stands is vigorous, well-stocked shortleaf pine seedling/sapling stands similar in composition to the existing stands. Current composition of these stands range from 70% to 94% shortleaf pine. The objective is to maintain this pine type composition with at least a 70% pine and up to 30% hardwood stocking. After harvest and site preparation, the proposed stands would change from a mature pine condition class to an early successional stage consisting of a mix of natural shortleaf pine seedlings; hardwood sprouts, seedlings, poletimber, and sawtimber; and grasses and forbs.

Hard mast trees with diameters of 8.0 inches or larger at 4.5 feet height and black cherry, dogwood, French mulberry, persimmon, serviceberry, plum, and Ozark chinquapin would not be treated during site preparation. Hardwood key areas also would not be treated. This would contribute to the hardwood composition objective defined above.

Regenerating these stands would provide diversity in the project area by increasing the number of acres in the 0-10 year age class. Before implementation in 2016, zero percent of the forested acres would be in the 0-10 year age class. Regenerating 378 acres by shelterwood harvest would improve habitat quality by providing early seral stands of a younger age class. The percentage of early seral acres after implementation in 2016 would increase the forested acres in this age class by approximately 9% due to shelterwood regeneration. Early seral habitat would be provided for the next ten years on these 378 acres as they reach 10 years of age.

Approximately 68% of the pine/pine-hardwood acres are in the 41-year old and older age classes. Regenerating 378 acres of shortleaf pine would help break up these age classes preventing a large part of the area from getting old at one time. The percentage would fall to approximately 59% following implementation. Breaking up the age classes now would help prevent mortality occurring all at one time.

The forest type of the shelterwood stands would not change. The percentage of hardwoods would increase in the harvested stands initially. As the shortleaf pine mature, a percentage of the smaller hardwood component would be lost due to competition and control. Approximately 10-20 leave den trees and mast producing hardwoods per acre would be left when the stand is regenerated. This hardwood component would remain in the stands.

Table 14. Forest Age Class Distribution by Current Condition, Proposed Action, No Action Plus 10 Years

	Current Age Class		After Proposed Action		No Action - 2021	
Age Classes (years)	**Acres**	**Percent**	**Proposed Action**	**Percent**	**No Action**	**Percent**
grass/forb*	4	0.01	15	0.33	4	0.01
0-10	0	0	378	9	0	0
11-20	248	5	248	5	0	0
21-40	899	20	899	20	992	22
41-70	1692	37	1686	37	1683	37
71-100	1123	25	959	21	584	13
100+	550	12	331	7	1253	28

Prescribed burning for site preparation and wildlife habitat improvement/fuels reduction is proposed in this alternative. Light to moderate intensity burns would temporarily reduce woody species coverage in the stands. Almost all of the hardwood species, most of the shrubs, and most of the vines are fire-adapted. While these may be top-killed by the burn, rootstocks would not be affected and resprouting would occur. Hardwood vegetation is expected to return to pre-burn levels in 5-7 years.

The temporary control in hardwood sprouts after site preparation burning would allow pine seedlings to become established in the regeneration areas. Seedbed site preparation by prescribed burning for shortleaf has been observed to increase seedling establishment one to five times that of unburned controls (Shelton and Wittwer, 1992).

Prescribed burning would reduce the risk of serious wildfire potential to the Wildland Urban Interface areas on approximately 33% of the project acres.

The shelterwood stands would be planted with shortleaf pine if natural seedfall does not regenerate the sites. These non-stocked areas would change to a stocked condition following planting and certification after the third year check.

Stands that are proposed for thinning are overstocked resulting in a competition for water, sunlight, and nutrients. These trees are reaching or have reached maturity level and are becoming more susceptible to insect infestations, oak hypoxylon canker, and stress.

Pine boring beetles (e.g., black turpentine beetle, ambrosia beetle) and pine bark beetles (e.g., Ips engraver beetle, southern pine beetle, southern pine sawyer) can attack and overwhelm unhealthy stressed pine forests. Once insect infestations start, it is too late to effectively treat large areas and many acres of trees rapidly die. Prevention is the control method of choice by thinning stands to reduce competition and relieve moisture stress. By keeping the trees healthy, beetles are often exuded from the trees by pitch and are less likely to reach epidemic proportions.

Upland hardwood trees are susceptible to many insects and diseases. The annual combined loss due to insects and diseases is often more than the losses to forest fires. Some losses to insects and diseases are unavoidable. However, most losses can be avoided through proper forest management. Maintaining healthy stands by promoting tree vigor helps to avoid these losses.

Thinning would reduce the basal area in these stands and increase growth, vigor, and sustainability of the

remaining trees. Thinning would relieve moisture stress while allowing space for new pine and hardwood seedlings to become established. Vigorous growth would produce timber that is of good quality for future supply.

In woodlands treatment areas, herbaceous vegetation plant and animal diversity is expected to increase dramatically. Plants such as bluestem grasses and various forbs should flourish. This would occur on approximately 85% of the project acres.

Stands proposed for cedar thinning contain patches of thick cedar causing the crowns of these trees to grow together. This has prevented sunlight from reaching the forest floor creating bare ground under these cedar trees. Thinning these stands would reduce the trees per acre and increase growth and vigor of the remaining trees. Opening up these stands would increase the amount of sunlight reaching the forest floor and improve conditions for ground level plants such as bluestem grasses and various forbs. Where cedars occur on overgrown glades, glade plants should return to these special communities.

Release treatment would be selective, treating a four-foot radius around each desired leave tree. Approximately 21% of each stand would remain untreated because vegetation would only be treated on an 8' x 8' spacing. The vegetation within the four-foot treated circle would be suppressed and the desired shortleaf pine or hardwood leave tree would gain sufficient height growth to exceed the competing vegetation. This release would allow forbs and grasses established last entry to continue to thrive in these stands contributing to plant and animal diversity and insuring them viability until the next entry.

Removing the seedtrees in stands proposed for seedtree removal may create linear openings in the stands as the seedtrees are skidded out. Grasses and forbs and eventually tree species would reclaim these open areas. Shortleaf pine seedlings may be damaged or eliminated in this removal but this would not decrease the stocking level below stocking standards.

During wildlife stand improvement, vegetation within a six-foot radius of the selected hardwood leave tree would be treated on a 12’ x 12’ spacing. The treated vegetation would be suppressed and the desired hardwood leave tree would gain sufficient height growth to exceed the competing vegetation.

Wildlife opening construction would change the area from the existing forested condition to an open area consisting of grasses and forbs. Brush species could sprout back but the openings would return to a grass/forb condition once restoration is repeated on a two-year rotation.

In the wildlife openings proposed for restoration, vegetation would change from the existing brushy condition to one of improved forage preferred by wildlife. Brush species could sprout back but the openings would return to a grass/forb condition once restoration is repeated on a two-year rotation.

Road maintenance would include cutting back encroaching brush from the road right-of-ways. Vegetated areas would be disturbed when roads are bladed and ditches are reworked. Brush and vegetation would eventually reclaim these disturbed areas.

Temporary road construction would change these corridors from a forested condition to a grassy condition. Following the sale, these roads would be blocked and vegetation would be allowed to reclaim these corridors with time.

Road construction would change these miles of corridor from a forested condition to an open corridor that may include grasses on the edges of the road.

Road reconstruction that includes widening roads would remove existing trees. These corridors would become part of the roadway and may include grasses on the edges of the road.

Road decommissioning would restore roadways back to a more natural state. Decommissioning would include reestablishing former drainage patterns, stabilizing slopes, blocking the entrances, installing water bars, removing culverts, removing unstable fills, pulling back road shoulders, scattering slash on the roadbed, and restoring natural corridors. Vegetation would reclaim these corridors over time.

Road closure of system roads would include seeding with wildlife-preferred seed mixtures and over time

would provide a more grassy condition along these roadways.

Treatment of non-native invasive species (NNIS) would reduce intra-species competition encouraging native grasses and forbs to fill in the available habitat. Species that would be treated include but is not limited to Tree-of-heaven, paulownia, mimosa, privet Sericea lespedeza, kudzu, fescue, etc. This would include any species from the Regional Forester's List of Invasive Exotic Plant Species of Management Concern.

Stream habitat management is proposed on approximately 13.0 miles of streams in the project area. Large wood would be felled or placed in the streambed. Anywhere from 8-20 trees per mile would be placed in the streams. Small openings created by this tree removal would be vegetated by grasses and shrubs and eventually by seedlings and saplings.

Alternative 2
Implementing the no action alternative would allow continued growth of the vegetation. There would be little or no substantial short-term effect on vegetation in this alternative. However, if the no action alternative were followed indefinitely, then there would be a long-term effect. In the stands which are presently 70 years of age and older, there would be a loss in growth rates and a higher rate of mortality. As the pine trees die, they would be replaced by hardwood species, principally oak and hickory, which are now present in the midstory. Average site indices for the area are 60-70 for shortleaf pine. This is equivalent to 50-60 for upland oak (primarily black oak, blackjack oak, post oak, and a small component of white oak), usually of poor merchantable quality on these sites. The primary value of these species would be for wildlife habitat, but typically, mast production is not consistent on the sites in this area.

Additional acreage would not be added to the 0-10 year old age class. Therefore, plant diversity would not increase.

The basal areas in the younger stands would continue to increase. This would result in crown closure that would gradually reduce and eventually eliminate populations of early stage understory plants and the animal species associated with these vegetative communities. Plant species composition would be restricted to plants that can tolerate heavy shade resulting in a decrease of diversity.

Heavy stem density in the canopy would also result in increased stress/competition leading to a higher incidence of mortality due to drought, insects and disease, loss of vigor and eventually stagnation.

Brush species along roadways would continue to encroach into the right-of-ways. Erosion would continue on system roads and trails.

Wildlife openings would grow up in unfavorable grass and brush species and eventually be taken over by pine and hardwood stems.

The exclusion of prescribed burning would cause the buildup of duff and needle layers to continue in the project area. This would reduce the number of small mammals, seed-eating birds, as well as some species such as deer and turkey. The lack of controlled prescribed burning would increase the chances of a catastrophic wildfire in this area. The possibility of wildfires within the WUI would increase.

Non-native invasive plant species would continue to become established in the project area.

K. WILDLIFE

Existing Condition

Wildlife, fish and plant species and their habitats in the project area are managed in cooperation with the Arkansas Game and Fish Commission (AG&F) and the Arkansas Natural Heritage Commission (ARNHC). The state wildlife management agencies main responsibilities are to set policy for hunting and fishing regulations and law enforcement programs. The project area is part of the Mt. Magazine Wildlife Management Area.

The Natural Heritage Commission is responsible for maintaining information on rare plants, animals and natural communities in Arkansas. The Forest Service is responsible for managing fish and wildlife habitat conditions on National Forest lands. The following discussion focuses on the habitat conditions that support

wildlife populations and fisheries.

The aquatic fauna in the project area is very diverse. The richness and diversity of this area is the result of several factors including long geological history of favorable climates and habitats, a lack of glaciation during the Pleistocene era, and a wide variety of aquatic habitats in the Arkansas River Valley eco-region. The streams within the eco-region are typically clear, extremely high gradient, and riffle and pool habitat dominated systems with gravel, cobble, boulder, and bedrock dominated substrates of sandstone, shale, and limestone. The Ouachita Highlands eco-region does not have as many karst features as some of the other eco-regions in northwest Arkansas, but there are still many caves, springs, and seeps within the system. Streams within the Ouachita Highlands eco-region are classified as nutrient poor systems with much of the energy derived from an allochthonous food chain.

The project analysis area contains a high proportion of late seral wildlife habitat, and lacks open woodland capable of supporting diverse understory grass and herbaceous vegetation. Under the National Forest Management Act (NFMA) regulations, adopted in 1982, selection of management indicator species (MIS) during development of forest plans is required (36 CFR 219.19 [a]). Management Indicator Species (MIS) are selected "because their population changes are believed to indicate the effects of management activities" (36 CFR 219.19 [a] [1]). They are used during planning to help compare effects of alternatives (36 CFR 219.19 [a] [2]) and as a focus for monitoring.

Table 15 shows Ozark National Forest MIS species pertinent to the Mt. Magazine Ranger District, the habitat type they represent, and population trends (Arkansas Game and Fish Commission - 2001, 2006, 2007a, 2007b; U.S. Department of Agriculture, 2001, 2007; and NatureServe 2010). From the Forest MIS list, 15 species have potential habitat based on occurrence records and/or habitat requirements within the analysis area and will be addressed.

Table 15. MIS Species, Habitat Requirements, and Population Trends.

Species	MIS Type	Habitat Requirements	Population Trend
Northern bobwhite	ecological indicator	pine and oak woodland and native grasslands	decreasing
Whitetail deer	demand	mosaic of forest age classes	stable to increasing*
Black bear	demand	remote habitat with mature forest component with intermixed 0-5 year old regeneration	stable to increasing*
Wild turkey	demand	mature forest with open areas containing grasses/forbs/soft mast	stable to decreasing*
Prairie warbler	ecological indicator	regenerating forest communities	decreasing
Brown-headed nuthatch	ecological indicator	open pine forest and woodlands	stable to decreasing
Cerulean warbler	ecological indicator	communities associated with mature hardwood forest with complex canopy structures, and dry-mesic oak Forest communities	stable to decreasing
Northern parula	ecological indicator	communities associated with forests in riparian areas	stable
Ovenbird	ecological indicator	dry-mesic oak forests	stable to increasing
Red-headed woodpecker	ecological indicator	oak woodland overstories	stable to decreasing
Pileated woodpecker	ecological indicator	large snags	decreasing

Scarlet tanager	ecological indicator	mature dry-mesic oak forest communities	stable
Acadian flycatcher	ecological indicator	mature mesic hardwood forest communities	stable to increasing
Smallmouth bass**	demand	cool water stream communities	increasing
Largemouth bass**	demand	quality pond and lake habitat	stable

** Information from AGFC harvest data*

*** Also addressed under the Fisheries Section of this EA*

In 1996, the Southern Region of the USDA Forest Service adopted "The Southern National Forest's Migrant and Resident Landbird Conservation Strategy" (Gaines and Morris 1996) to improve monitoring, research, and management programs affecting forest birds and their habitats. A region wide program of monitoring avian populations based on point-counts was initiated as part of this strategy. The results of this monitoring effort are reported in General Technical Report – NRS-9 (U.S. Department of Agriculture, 2007), and summarized for MIS avian species on the Ozark National Forest in supporting documentation (Taylor, 2011). Data collected from 1992 to 2004 is utilized. Sampling strategy and point-count methodology is described in detail in Gaines and Morris (1996).

The analysis area is a mature forest matrix generally composed of a shortleaf pine sub-matrix and an oak-hickory sub-matrix. Currently on federal lands, approximately 312 acres or 7% of the analysis area is composed of hardwood/hardwood-pine forest types of an age capable of producing abundant hard mast for wildlife. Pine/pine-hardwood forest types comprise approximately 4200 acres or 93% of the analysis area. Grassland/open areas on federal lands in the analysis area comprise approximately 4.5 acres or 0.01% of the total area, primarily consisting of permanently maintained wildlife openings.

Hard mast capability is patchy across the landscape. The majority of the analysis area's hardwood forest types are currently of mast-producing age. These age classes are those which are 41+ years of age. These stands are found within stream corridors and on all aspects with the best representation found on the north and east slopes. Hard mast-producing trees are also represented within the shortleaf pine sub-matrix, but to a lesser degree.

The mast needs of many forest animals are met when at least 20 percent of 640 acres (one square mile) is occupied by well-distributed mast-producing hardwood trees (Wildlife Habitat Management Handbook, 204.1).

At present, approximately 0% of the public lands in the project area (forest and woodlands) are in an early seral condition (0-10 years of age).

The analysis area reflects conditions that are seen Forest wide in relation to age classes of forest stands. The analysis area contains a high proportion of late-seral wildlife habitat, and lacks open woodland capable of supporting diverse understory grass and herbaceous vegetation as shown in Table 16.

Table 16. Forest Age Class Distribution by Alternative (Public Lands).

	Alternative 1		Alternative 2	
Age Classes (years)	**Proposed Action Acres**	**% Total Acres**	**No Action Acres**	**% Total Acres**
grass/forb*	15	0.33%	4	.01%
0-10	378	9%	0	0%
11-20	248	5%	248	5%
21-40	899	20%	899	20%
41-70	1686	37%	1692	37%
71-100	959	21%	1123	25%
100+	331	7%	550	12%

** Grass/forb acres are represented by existing and proposed wildlife openings. Grass/forb habitat is interspersed amongst forest stands shown in the preceding table in the 0-10 year through 100+ age classes.*

The majority of pine forest types in the analysis area are currently in age classes >41 years of age (approximately 75%). These stands are represented on all aspects, ridgetops and bottomland areas.

There are 3 permanent wildlife openings within these compartments. See the Wildlife Habitat Map on page 19. The LRMP objective is to have at least 4 well distributed 1-5 acre openings per 640 acres of land (LRMP- FW34, p. 3-6).

Because there is adequate woodland habitat, RLRMP standards should be met.

Currently, there are 18 permanent ponds in the project area. Several intermittent streams provide seasonal water for the project area along with Prairie Creek, a perennial stream. A goal of the RLRMP is to provide at least two permanent water sources per 640-acre habitat unit (RLRMP, p. 4-7). No additional ponds are needed to meet the goal of the RLRMP. Water is seasonally widespread enough throughout the area to meet seasonal availability needs of most wildlife species.

Effects

Alternative 1

Effects to wildlife and MIS from implementation of the action alternative are analyzed in detail in a reference paper compiled for the Pleasant Hill and Mt. Magazine Ranger Districts (Taylor, 2011). This paper is part of the project analysis file.

With implementation of Alternative 1, approximately 378 acres would be converted, through harvest and subsequent regeneration, from the 71-100 year age classes to the 0-10 year age class. Browse and early-successional forest habitat would be provided in these regeneration areas for a variety of wildlife species. Viability of disturbance-dependent avian species would be enhanced. Avian species requiring both large and small areas of early successional vegetation and forest edge would benefit. Implementation of shelterwood regeneration systems would result in 8% of the public land-base within the analysis area compartments in early successional forest habitat, as opposed to 0% under current conditions. In addition, approximately 15 acres in the 41-100 year age classes would be converted to grass/forb habitat (wildlife openings). This would result in 0.3% of the public land-base within the analysis area being in grass/forb habitat, as opposed to 0.01% under current conditions.

Overall, in both pine and hardwood forest types, implementation of Alternative 1 would result in an approximate 9% reduction of forest habitat that is greater than 71 years old. Following implementation of this alternative, approximately 28% of the forested (both pine and hardwood) public land base within the analysis area compartments would remain in the 71-100+ year age classes. When considering recruitment of stands from the 41-70 year age classes (approximately 1686 acres or 37% of analysis area land base) in the next 1-30 years, and examination of distribution of stand age classes, fragmentation of interior forest

habitat is not anticipated.

Timber Harvest and Wildlife Habitat Improvement.

Effects of implementation of the action alternative are described in Taylor (2011), in relation to the subsections Early Successional Habitat, Soft Mast Production, and Hard Mast Production. Indirect negative effects to wildlife species dependent upon older seral stages and habitat requirements associated with closed canopy conditions would occur. Thinning to help restore woodland conditions, riparian conditions, and creation of wildlife openings to improve herbaceous diversity would cause positive indirect impacts to many species of wildlife. Short-term early-successional habitat in regenerated forest stands would occur, thereby causing positive indirect effects to disturbance-dependent and early successional obligate wildlife species. Use of thinning and regeneration harvest would improve production of soft mast. Increases in abundance of soft mast utilized by a variety of wildlife species as a reliable seasonal food source would occur. Regeneration silvicultural treatments would provide age class diversity and maintain oak in the ecosystem as a source of hard mast for wildlife species. Oak species would be expected to be maintained as a component of the forest ecosystem in the long term. This alternative would cause positive indirect impacts to wildlife species. Diverse and high quality habitats supporting well-distributed and viable populations of all native and desired non-native plants and animals would meet desired conditions for fish and wildlife as specified in the RLRMP. Disturbance regimes within terrestrial habitats providing a stable and sustained flow of both early and late-successional habitats over time would meet desired conditions for fish and wildlife habitat as specified in the Forest RLRMP. Herbicide use (as proposed with Alternative 1) is an important tool often used in woodland restoration thinning and wildlife opening construction and restoration to prevent sprouting of woody species and therefore allowing for greater understory herbaceous vegetation abundance and diversity.

Silvicultural Treatments

These practices, which include release and tree planting are beneficial to wildlife in the long-term. These practices provide indirect beneficial effects to wildlife by insuring long-term perpetuation of hard mast-producing trees and shortleaf pine in the ecosystem.

Prescribed Fire

Implementation of prescribed fire may cause some direct mortality to small mammals and herpetofauna in the short-term. However, Kirkland et al. (1997) found that fire effects upon small mammals in oak-dominated forests are transitory. Quantitative differences between burned and unburned habitats were found to disappear within eight months following the burn. Rapid recovery of populations of small mammals in burned forests may be due to the rapid regrowth of ground cover from surviving rootstocks. Research found there were few discernible differences in small mammal and herpetofauna populations between burned and control areas, supporting the contention that prescribed fire in the project area had little overall impact on the terrestrial vertebrate fauna. In addition, immediate impacts of the burn on small mammals are slight as many species exhibit varying degrees of fossorial habits (Ford et al., 1999). In a study within the upper piedmont of South Carolina, (Kilpatrick et. al. 2004) found that prescribed burning and thinning for fuel reduction had minimal effects on herpetofauna in upland pine plantations. Prescribed burning has been found to change the composition of woody species seedlings. Due to reduction in the number of shade-tolerant species from prescribed burning, greater equitability among tolerant and intolerant species seedlings occurred. Mechanical removal of understory vegetation followed by prescribed fire provided both greater equitability among species and higher levels of photosynthetically active radiation reaching the forest floor (Dolan, 2004). Prescribed burning and sub-canopy removal are important tools in improving conditions for oak seedling establishment while reducing competition from shade-tolerant species. Shelterwood/Oak-Restoration harvest followed by prescribed fire simulates the combined events of overstory disturbance followed by fire; these are related events that have shaped the composition of oak ecosystems for millennia (Van Lear, 2000).

Herbicide Use

Herbicide use is an important tool for benefiting pine regeneration by providing for these species presence in the ecosystem in the long term. Herbicide use is also an important tool for maintaining and improving grass/forb habitat for wildlife. Effects of herbicide toxicity data and dosage estimates for triclopyr, imazapyr, imazapic, and glyphosate proposed for use in this action alternative indicate that there is only a very low risk to wildlife, both from realistic and extreme exposures. Monitoring for herbicide concentrations following use has been a continuous policy of the Ozark-St. Francis National Forests. Results have not documented any considerable concentrations of herbicides or off-site movement. In a study regarding the use of herbicides in forestry applications (Michael, 2001), the author found that maximum pesticide concentrations observed in water have been much lower than the maximum levels which the Environmental Protection Agency (EPA) considers safe for consumption on a daily basis over a lifetime (HAL). In some studies, the author reviewed maximum herbicide concentrations observed in ephemeral to first-order streams exceeded the lifetime HAL, but found that they last only a few hours and the highest concentrations did not exceed EPA's 1-day HAL. Even with the widespread use of pesticides in North America, those typically used in forestry vegetation management programs have not been identified in surface or ground water at sufficiently high concentrations to impair drinking water quality. Their rapid break-down by physical, chemical, and biological routes coupled with current use patterns precludes the development of noteworthy water contamination problems unless they are applied directly to water. Additionally, mitigation measures normally employed through State Best Management Practices (BMPs) further restrict herbicide's effects outside the boundaries of its application. On February 23 and 24, 2009 analysis of risk was performed for the chemicals glyphosate, imazapyr, imazapic, triclopyr amine, and triclopyr ester at the proposed rate of application in SERA risk assessments prepared for the USDA Forest Service. In a variety of human health and environmental health scenarios (including a variety of wildlife scenarios) most Hazard Quotients were projected to be below the Forest's maximum acceptable standard of 1.0. Application of mitigation measures shown previously in this document and adherence to Forest Standards for herbicide use and chemical labels for application would negate hazard quotients > 1.0 related to drift, accidental spills and run-off. Parameters and output from these analyses are available as part of the process record at the Mt. Magazine Ranger District Office.

Glyphosate is not soil active and has low toxicity to animals. Lab studies conducted specifically on bobwhite quail also demonstrate extremely low toxicity. Typical hazard quotients for foliar and cut surface application for glyphosate to wildlife are less than 1. Glyphosate has been researched in conjunction with Colony Collapse Disorder (CCD) in honeybees. According to vanEnglesdorp, 2009, no single factor was found with enough consistency to suggest one causal agent for CCD. Other factors being analyzed as potentially contributing to CCD include pathogens such as the Israeli acute paralysis virus (IAPV) and other viruses, bacteria, and funguses. While pesticides and their effects on CCD have been studied, IAPV of bees was found to be strongly correlated to CCD and is a significant marker for CCD (Cox-Foster et.al, 2007).

Imazapic is weakly absorbed in basic soils, but absorption increases in acidic soils. This herbicide has low toxicity to animals. Hazard quotients calculated for risk to terrestrial wildlife are all less than 1.0 (see process record for specific numbers).

Imazapyr has very low toxicity to mammals or other animals, however it can be soil active particularly during spring leaf expansion. Application after mid-September may yield soil activity the following spring. All HQ's are well under 1.0, (see process record for specific numbers) with the exception of effects to aquatic plants. Any non-target plants if occurring in proximity to treated plants, could be killed and this could indirectly affect habitat for MIS on a very small scale.

Triclopyr Amine and Triclopyr Ester have low bioconcentration potential and single dose toxicity to mammals is low although prolonged or repeated exposure may cause skin irritation in mammals (MSDS dated 1/17/2001). Typical hazard quotients associated with both foliar and cut surface application of triclopyr for wildlife are less than 1.0, with the exception of the longer-term (90 days) exposure of a large mammal to contaminated vegetation on site (see process record for specific numbers). These upper bound HQs are not a concern because:

- The scenario assumes a diet composed of 100% contaminated vegetation or insects from the site which is highly unlikely. The long-term HQ assumes that vegetation is consumed on the same site for 90 days which is also unlikely.
- The HQs deal with individuals, not populations.

- The amount of non-target vegetation subject to spray deposition is very small and animals are unlikely to be eating vegetation treated with cut surface application of chemical in WSI, wildlife opening and site preparation areas.

Direct effects, occurring at time of application, to birds or large mammals are unlikely, since these species are likely to move from the area when project activities are implemented. Although direct effects to amphibians are more likely since contact with herbicide could be absorbed through the skin and effect metabolic activity, amphibians are likely to be under logs, rocks or leaves, making direct contact with chemicals less likely. Direct effects to other non-target plants occurring in these habitats could occur. Application methods, including direct application to target foliage, or to application to cut surfaces, would minimize the possibility for spills and/or direct contamination to non-target species.

Indirect effects to MIS birds or mammals could occur if these species were to ingest foliage or seeds contaminated with any of the chemicals proposed in Alternative 1, however, none of the chemicals would bioaccumulate in organisms. Indirect effects to MIS and habitats treated with all chemicals are likely to be negligible given that applicators treat target organisms only and that mitigation measures and forest-wide standards would be used.

There are likely to be few negative cumulative effects to MIS species over time as a result of implementing Alternative 1. None of the herbicides proposed for use would bioaccumulate or have lengthy half lives in the environment. Related to cumulative impacts, the Mt. Magazine District is proposing in this NEPA analysis to apply herbicide in the analysis area on up to 700 acres annually to treat non-native invasive species (NNIS). Realistically, for the reasonably foreseeable future, this may amount to 300-700 acres of herbicide treatment in the analysis area for NNIS over five years after project implementation. No other herbicide projects are known to be occurring within the project area except for those listed in the Proposed Action. Efforts to maintain early seral habitat and restore herbaceous species biodiversity in WSI areas, and TSI treatments and site preparation treatments to benefit pine regeneration and hard mast producing species are also likely to cumulatively benefit associated MIS species.

The past and proposed use of herbicides would have no negative direct, indirect or cumulative effects on water quality or wildlife with adherence to Forest Wide Standards FW19 - FW 32 in the RLRMP. Proposed herbicide use would have beneficial effects on species using early-successional habitat. This would occur by allowing creation and restoration of wildlife openings, reduction of overstory and midstory canopy in WSI areas, and promoting pine regeneration through site preparation practices.

Road Work

No negative long-term impacts to wildlife would occur through proposed road construction, road reconstruction, road maintenance or temporary roading. Closure of roads following use would reduce disturbance to wildlife. Reconstruction and maintenance of roads would lead to improved water quality by reducing existing erosion, through use of improved road design features. Application of BMPs and RLRMP forest-wide standards (FW-72 – FW-76, FW-78, FW-79, FW-81, FW-82, and FW-87 – FW-90) would be utilized for all road related work. Unmaintained and unauthorized non-system roads are one of the most common sources of accelerated erosion on National Forest lands. The proposed action would serve to assist in “disconnecting” the road system from the stream network. Road maintenance would help preclude entrainment of sedimentation in creeks from poor quality roads. This would cause positive indirect impacts to water quality and aquatic species. Open road density in the project area would in most cases be reduced by road decommissioning and closure of roads with gates – allowing administrative access only. This would serve to reduce potential erosion, providing positive indirect impacts to water quality and aquatic species. Gating areas, including some large blocks, would provide habitats for species sensitive to human disturbance and provide opportunity for more remote wildlife-related recreation opportunities.

Alternative 2
Only currently approved management actions would continue under this alternative.

Effects to wildlife and MIS from implementation of the no action alternative are analyzed in detail in a reference paper compiled for the Pleasant Hill and Mt. Magazine Ranger Districts (Taylor, 2011). This paper is part of the project analysis file.

Timber Harvest and Wildlife Habitat Improvement.

Effects of implementation of the no action alternative are described in Taylor (2011), in relation to the subsections Early Successional Habitat, Soft Mast Production, and Hard Mast Production. Indirect beneficial effects to wildlife species dependent upon older seral stages, and habitat requirements associated with closed-canopy conditions would occur. Thinning to help restore woodland conditions and creation of wildlife openings to improve herbaceous diversity would not occur. Short-term early successional habitat in regenerated forest stands would not occur, thereby causing negative indirect effects to disturbance-dependent and early successional obligate wildlife species. Lack of use of thinning and regeneration harvest would not allow for improved production of soft mast. Increases in abundance of soft mast, utilized by a variety of wildlife species as a reliable seasonal food source would not occur. Regeneration silvicultural treatments would not be implemented to provide age class diversity in pine and to a lesser extent maintain oak in the ecosystem as a source of hard mast for wildlife species. Oak species would be expected to become a minor component of the forest ecosystem in the long term without major forest stand disturbance or treatments that favor oak regeneration. This alternative would cause negative indirect impacts to wildlife species. RLRMP recommendations of diverse, high quality habitats supporting well-distributed and viable populations of all native and desired non-native plants and animals would not be met. Natural disturbance regimes within terrestrial habitats providing a stable and sustained flow of both early- and late-successional habitats over time would not meet desired conditions for fish and wildlife habitat.

Silvicultural Treatments

Silvicultural practices, including pine release and planting of pine (as necessary) would not occur. Lack of improvement of stands containing beneficial tree species for wildlife would not occur, thereby causing indirect adverse impacts.

Prescribed Fire

Prescribed fire would not be implemented in the project analysis area with adoption of this alternative. Benefits to wildlife from: sustaining oak in the ecosystem for hard mast production; restoring woodlands for increased herbaceous diversity and density; maintaining pine as a major component in the ecosystem; maintaining other fire-dependent or adapted species and habitats; and abatement of non-native invasive plant species would not occur. Lack of use of prescribed fire would not allow for improved production of soft mast. Increases in abundance of soft mast utilized by a variety of wildlife species as a reliable seasonal food source would not occur. This would cause negative indirect impacts to wildlife species. RLRMP (USDA, 2005) recommendations of diverse, high quality habitats supporting well-distributed and viable populations of all native and desired non-native plants and animals would not be met. Natural disturbance regimes within terrestrial habitats providing a stable and sustained flow of both early- and late-successional habitats over time would not meet desired conditions for fish and wildlife habitat.

Herbicide Use

Herbicide use for site preparation in pine shelterwood harvest areas is an important tool for benefiting pine regeneration, by reducing interspecies competition and providing for this species presence in the ecosystem in the long term. Herbicide use for completion of WSI and wildlife opening construction/restoration is an important tool for improving grass/forb habitat for wildlife. Without use of this tool, benefits to pine regeneration and wildlife would not occur.

Road Work

Road maintenance, road decommissioning and closure of roads to administrative use only would not occur. The “No Action” alternative would not serve to disconnect the road system from the stream network. Road maintenance at levels expected to occur with the action alternatives would not occur, thereby allowing entrainment of sedimentation to continue in creeks from poor quality roads. This would cause adverse indirect impacts to water quality and aquatic species. Open road density in the project area would remain status quo, thereby allowing potential erosion to cause adverse indirect impacts to water quality and aquatic species.

L. FISHERIES

Existing Condition

The analysis area for fisheries effects is comprised of all streams and waterbodies within and downstream of Compartments 1, 14, 56, and 55 within the Spring Creek and Prairie Creek Watersheds. The major streams in the project area include Prairie Creek, White Creek, Dooley Branch, Spring Creek, and Box Springs Branch. The entire project area falls within the Arkansas River Valley ecoregion.

Field visits were made to the project area to collect habitat and species composition information to determine potential project activities that could be included in the alternatives and to evaluate the potential for effects from all the proposed management activities. The Spring Creek and Prairie Creek Watersheds were inventoried in the summer of 2005 (Nuckols et al., 2006). Prairie Creek was not surveyed during the field visits. Dooley Branch was not surveyed because the stream was dry but observers did note a lack of large woody debris in the channel. Spring Creek, Box Springs Branch, White Creek, and Bob Barnes Branch were inventoried as part of the survey.

Table 17 displays the habitat collected in the summer of 2005 with the number of pieces of large woody debris per mile and the pool/riffle ratio for Spring Creek, Box Springs Branch, White Creek, and Bob Barnes Branch (Nuckols et. al, 2006).

Table 17. Stream Habitat Collected in the Project Area.

Stream Name	Large Woody Debris (pieces/mile)		Pool/Riffle Ratio
	>3.3 feet long >3.9 inches diameter	>16.4 feet long >19.7 inches diameter	
Spring Creek	0	0	70/30
Box Springs Branch	2	0	100/0
White Creek	0	0	100/0
Bob Barnes Branch	8	0	10/90

These stream showed a lack of overall large woody debris in both the larger size class (greater than 16.4 feet long and greater than 19.7 inches in diameter) and the smaller size class (greater than 3.3 feet long and greater than 3.9 inches in diameter) compared to the objectives set aside in the RLRMP.

Regulation 2 of the Arkansas Pollution Control and Ecology Commission states: “High quality streams of the Arkansas River Valley ecoregion would support diverse communities of indigenous or adapted species of fish and other forms of aquatic life. Fish communities are characterized by a substantial proportion of sensitive species; a sunfish and minnow dominated community exists but with substantial proportions of darters and catfish (particularly madtoms)” (Arkansas Pollution Control and Ecology Commission, 2011.)

Table 18 shows the Key and Indicator species listed by the Arkansas Pollution Control and Ecology Commission under Regulation Number 2 for the Arkansas River Valley ecoregion.

Table 18. Key and Indicator Species.

Key Species	Indicator Species
Bluntnose minnow	Orangespotted sunfish
Golden redhorse	Blackside darter
Yellow bullhead	Madtoms
Longear sunfish	
Redfin darter	
Spotted bass	

Bob Barnes Branch was the only stream that fish surveys were completed on during the field visits to the watershed. Table 19 displays the fish species and number of fish that were captured. An Index of Biotic Integrity (IBI) was done for the fish sample from Bob Barnes Branch. This IBI was developed by the Arkansas Department of Environmental Quality (ADEQ) for the Arkansas River Valley eco-region. An IBI is a scientific tool used to identify and classify water quality within a waterbody based on biological species information. The IBI score for Bob Barnes Branch was in the poor range. The reason this stream did not score in the good range was the lack of species diversity in the stream because of the lack of water in these watersheds.

Table 19. Fish Species Captured in Bob Barnes Branch.

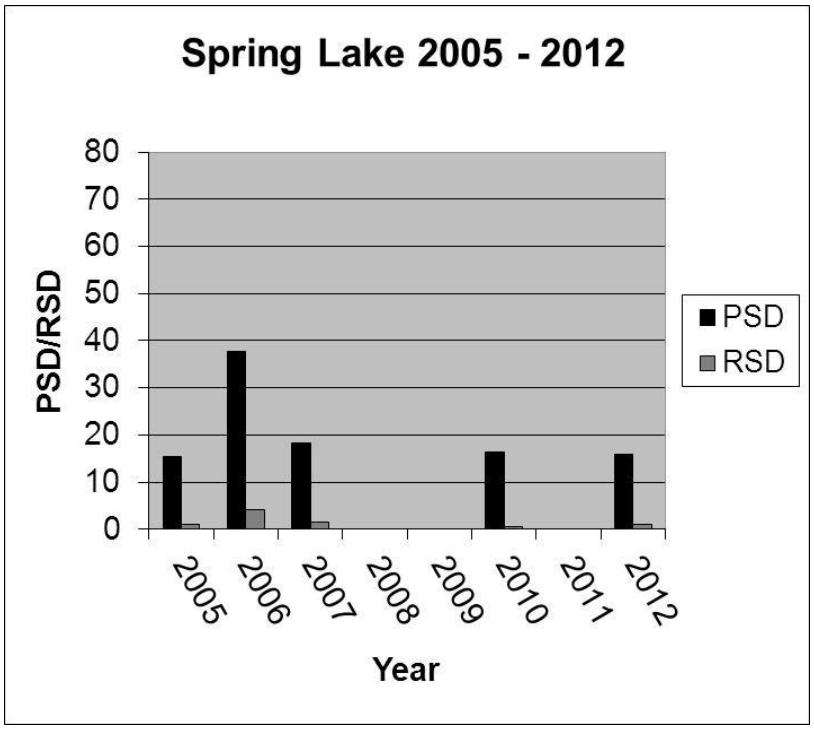
Fish Species	Total Individuals	Relative Abundance (%)
Bluegill	3	100%

Smallmouth bass was selected as a MIS due to popularity as a sport fish and as an indicator of high quality stream habitat. It is an inhabitant of cool, clear mountain streams with permanent flow and rocky bottoms. It is more intolerant to habitat alteration than any of the other black basses, and is especially intolerant of high turbidity and siltation. The species was not found during surveys of streams in the project area.

Largemouth bass was selected as a MIS due to popularity as a sport fish and as an indicator of high quality pond and lake habitat. It is an inhabitant of clear, quiet waters in natural and manmade lakes and ponds, and in the backwaters and pools of streams and rivers. It is of high turbidity and siltation and is often found during most of the day near logs or other cover in deep water. The species was found during Spring Lake surveys in 2005, 2006, 2007, 2010, and 2012.

Proportional Stock Density (PSD) and Relative Stock Density (RSD) are a measure of the balance of multiple size classes within a population. PSD are the number of quality length fish (>300 mm) versus the number of stock length fish (>200 mm) multiplied times 100 and RSD is the number of preferred length fish (>380 mm) versus the number of stock length fish (>200mm) multiplied times 100. The PSD for largemouth bass should range from 40-70 whereas RSD should range from 10-40 (Murphy and Willis 1996). The low PSD and RSD values for largemouth bass in Spring Lake are caused by a stunted population within the lake from overcrowding.

Figure 3. PSD/RSD values for Spring Lake.



Effects

Alternative 1

Streams are dynamic systems and are in a continuous state of change. Natural sedimentation would continue to occur from bank erosion and heavy rain events. In addition, sedimentation from private lands within the watershed would be expected to continue but is outside the control of the agency.

Data collected from the Spring Creek and Prairie watersheds would suggest that water quality has remained fair in the project area. Past management activities have included timber harvesting, silvicultural treatments, road construction and reconstruction, wildlife habitat improvement, and prescribed burning. National Forest management on these drainages has been ongoing since the early 1940s and water quality problems have not been noted.

Based on the analysis in the Soil and Water effects sections, along with the incorporation of the mitigation measures beginning on page 27; there would be no substantial effect on any stream (or aquatic species utilizing them) in the Spring Creek and Prairie watersheds.

There may be minimal increases in water yields. Since the streams in the analysis area are intermittent, any minimal increase in water yield would provide at the most, very limited benefits to fish populations. Increased water yields, particularly during the summer and fall, could benefit the fish populations in these streams by providing more through-gravel flow, increased nutrients, and more available aquatic habitat. However, since any increases are expected to be minimal and short term, there would not be any observable benefit to the fish population in the effected streams. Similarly, since any increases in yield would be small, there would not be any adverse effect from increased flow, such as increases in stream bank erosion or scouring.

The addition of the large woody debris would lead to greater habitat complexity which could lead to greater retention of water through the summer months. The addition of the large woody debris from the activities proposed in Alternative 1 would create more in stream habitat for all species, which could increase the biomass and productivity within these systems.

With this alternative, forest standards from the RLRMP and Best Management Practices (BMPs) guidelines

in Section VI of the Arkansas Forestry Commission's BMPs for Water Quality Protection would be implemented and followed.

BMPs used for streamside management areas are similar on the Ozark and Ouachita National Forests. Clinginpeel (1989) and Neihardt (1992) measured the effectiveness of Best Management Practices on the Ouachita National Forest in Arkansas and Oklahoma. Clinginpeel focused on BMPs for streamside management areas (SMAs) and for road crossings of intermittent and ephemeral streams. The measured parameters in both studies were sediment, turbidity in Jackson Turbidity Units (JTUs), conductivity, alkalinity, pH, nitrites, nitrates, sulfates, and chlorides. Additional parameters in Neihardt's study were total dissolved solids, hardness, turbidity in Nephelometric Turbidity Units (NTUs), acid, and several metals.

Clinginpeel found that sulfates differed considerably above and below stream crossings, but actual differences were small (1.84 mg/l and 1.94 mg/l, respectively). Above and below measurements at SMAs were statistically different for turbidity (16.1 JTUs and 19.5 JTUs, respectively) and pH (6.13 pH and 6.32 pH, respectively), but remained within State standards. All the other parameters were unchanged. Neihardt found that turbidity measured in JTUs was statistically different, but turbidity measured in NTUs was not. Both investigators concluded that forestry BMPs, as implemented on the Ouachita National Forest, effectively maintained water quality within State standards.

In a separate study, Clinginpeel (1993) evaluated the effectiveness of BMPs for silvicultural herbicide application on the Ouachita National Forest from Fiscal Years 1989 through 1993. Again, stormwater samples were collected above and below treated areas from streams in potentially impacted areas, and analyzed for positive readings of Garlon, Velpar, and Roundup. In all, 348 water samples were collected from 168 sites. Sixty-nine samples, or 19.8 percent, tested positive for herbicides, but all positive samples were less than one-quarter the EPA limit for the specific herbicide and the toxic limit for fish. He concluded that the BMPs tested effectively protected water quality and fisheries (Clinginpeel, 1989, 1993 and Neidhardt, 1992).

The replacement of road/stream crossings that are known barriers to aquatic organism migration would increase connectivity for the populations of aquatic organisms that live within the watershed. This would increase the genetic variability of the population as well as increase the ability to utilize for individuals to utilize different habitats during different times of the year.

Smallmouth bass has a low tolerance for sedimentation. The timber harvesting, silvicultural treatments, temporary road construction, system road reconstruction and construction, wildlife habitat improvement, prescribed burning, and other proposed activities may cause a temporary increase in sediment, but would be minimal because BMPs and forest standards would be followed during the activities. The use of herbicide in the project area would have no effect on smallmouth bass as long as label directions and agency protocols are followed. The addition of large woody debris to the streams would create greater stream complexity which could provide more habitat and greater amounts of food biomass for smallmouth bass within the project area. Given forest-wide standards and riparian standards, the activities associated with this project should keep smallmouth bass populations at current levels or increase the relative abundance of the species in the watershed.

Largemouth bass species have a low tolerance for sedimentation. The timber harvesting, silvicultural treatments, temporary road construction, system road construction and reconstruction, wildlife habitat improvement, prescribed burning, and other proposed activities may cause a temporary increase in sediment, but would be minimal because BMPs and forest standards would be followed during the activities. The use of herbicide in the project area would have no effect on largemouth bass as long as label directions and agency protocols are followed. The addition of large woody debris to the streams would create greater stream complexity which could provide more habitat and greater amounts of food biomass for largemouth bass in larger streams downstream of the project area as the large wood moves through the system. Given forest-wide standards and riparian standards, the activities associated with this project should increase largemouth bass populations in the watershed.

The effects of the proposed action, both individually and cumulatively, are not expected to have any considerable effects on the water quality within the project area. There would be no effect on fish or other aquatic species from the proposed actions in Alternative 1.

Alternative 2

No activities are planned or implemented with this alternative; therefore, no change would occur in stream conditions that would be attributable to management actions proposed here. Streams are dynamic systems and are in a continuous state of change. Natural sedimentation would continue to occur from bank erosion, from existing roads and trails, as well as heavy rain events.

Because no activities are planned with this alternative, aquatic MIS species would not be affected. Smallmouth and largemouth bass populations would stay at current levels within the watershed or could drop do to the lack of road and trail maintenance that would not be completed as part of the project and the roads and trails that would not be closed. This would be caused by the increase in sediment from these sources as they get increasingly more traffic. It also could be caused by the lack of habitat improvements from the lack of large wood in the stream system and the lack of aquatic connectivity caused by the fish passage barriers.

M. PROPOSED, ENDANGERED, THREATENED AND SENSITIVE SPECIES

Existing Condition

Forest Service Manual (FSM) Section 2672.41 requires a biological evaluation (BE) and/or biological assessment (BA) for all Forest Service planned, funded, executed, or permitted programs and activities. The objectives of this BE are to: 1) ensure that Forest Service actions do not contribute to loss of viability of any native or desired non-native species or contribute to trends toward federal listing, 2) comply with the requirements of the Endangered Species Act (ESA) so that federal agencies do not jeopardize or adversely modify critical habitat (as defined in ESA) of federally listed species, and 3) provide a process and standard to ensure that threatened, endangered, proposed, and sensitive species receive full consideration in the decision-making process.

Federally listed threatened and endangered species, species proposed for federal listing, and Southern Region sensitive species that may potentially be affected by this project were examined using the following existing available information:

1. Reviewing the list of TES plant and animal species known or likely to occur on the Ozark-St. Francis National Forests, and their habitat preferences. This review included the U.S. Fish and Wildlife Service current list of endangered, threatened, and proposed species for Arkansas as of Feb. 23, 2009, the forest-wide list as of Oct. 8, 2007 and the current Southern Region Sensitive Species list for the Forest, dated August 8, 2007.
2. Consulting element occurrence records (EORs) for TES species as maintained by the Arkansas Natural Heritage Program (ARNHP).
3. Consulting with individuals in the private and public sector who are knowledgeable about the area and its flora and/or fauna.
4. Reviewing sources listed in the reference portion of this report.
5. Reviewing the results of field surveys that have been conducted in the area.

Most TES species known to occur on the Forest have unique habitat requirements, such as glades, barrens, rock outcrops, bogs, caves, and natural ponds. Appendix A of the BE lists all 63 TES species currently known or expected to occur on or near the Ozark-St. Francis National Forest. All species on the list were considered during the analysis for this project.

A “step down” process was followed to eliminate species from further analysis and focus on those species that may be affected by proposed project activities. Species not eliminated are then analyzed in greater detail. Results of this “step down” analysis process are displayed in the Occurrence Analysis Results (OAR) column of the table in Appendix A of the BE. First, the range of a species was considered. Species’ ranges on the Forest are based on county records contained in such documents as An Atlas and Annotated List of the Vascular Plants of Arkansas, and NatureServe Explorer, but are refined further when additional information is available, such as more recent occurrences documented in scientific literature or in Natural Heritage databases. Many times, historic range information clearly indicates a species will not occur in the

analysis area due to the restricted geographic distribution of most TES species. When the analysis area is outside a known species range, that species is eliminated from further consideration by being coded as OAR code "1" in the Appendix A table. For the remaining species, after this first step, results from past surveys, knowledge of the analysis area and potential for suitable habitat were considered.

These resources and information were compiled to produce a site-specific biological evaluation for this project (Lawson, 2013).

Species Identified as Being in the Action Area or Potentially Affected by the Action

From past field surveys and knowledge of the area, and given the proposed action, those species which are analyzed and discussed further in this document are those that: a) are found to be located in the activity area (OAR code "5"), b) were not seen during the survey(s), but possibly occur in the activity area based on habitat observed during the survey(s) or field survey was not conducted when species is recognizable (OAR code "6"), and c) aquatic species known or suspected downstream of the project/activity area, but where project effects would be immeasurable or insignificant (OAR code "7").

As a result of this process, the following species occur as documented by field surveys or may potentially occur in the activity area based on habitat observations:

Table 21. Threatened, Endangered, or Sensitive Species Occurrences in the Prairie Project.

OAR Code	Scientific Name	Common Name	Taxa	Status
6	*Aimophila aestivalis*	Bachman's sparrow	Bird	Sensitive
6	*Haliaeetus leucocephalus*	Bald eagle	Bird	Sensitive
6	*Corynorhinus townsendii ingens*	Ozark big-eared bat	Mammal	Endangered
6	*Myotis grisescens*	Gray bat	Mammal	Endangered
6	*Myotis leibii*	Eastern small-footed bat	Mammal	Sensitive
6	*Myotis sodalis*	Indiana bat	Mammal	Endangered
6	*Lirceus bicuspicatus*	An isopod	Isopod	Sensitive
6	*Amorpha Ouachitensis*	Ouachita leadplant	Plant	Sensitive
6	*Callirhoe bushii*	Bush's poppymallow	Plant	Sensitive
6	*Castanea pumila var. ozarkensis*	Ozark chinquapin	Plant	Sensitive
6	Cypripedium kentuckiense	Southern lady's slipper	Plant	Sensitive
6	Delphinium newtonianum	Moore's larkspur	Plant	Sensitive
6	Solidago ouachitensis	Ouachita mountain goldenrod	Plant	Sensitive
6	Tradescantia ozarkana	Ozark Spiderwort	Plant	Sensitive
6	Valerianella nuttallii	Nutall's cornsalad	Plant	Sensitive

Fifteen species were not seen during field surveys, but possibly occur in the analysis area based on habitat observed or the field surveys were conducted when the species is not recognizable (OAR code"6");

Effects

Alternative 1
The analysis of possible effects to species identified as known or expected to occur in the vicinity of the proposed project, or likely to be affected by the action, includes the following existing information:

1. Data on species/habitat relationships.
2. Species range distribution.
3. Occurrences developed from past field surveys or field observations.
4. The amount, condition, and distribution of suitable habitat.

Effects to species include anticipated effects from implementation of the proposed action. Predicted effects to species shown in the table above are described in the Biological Evaluation for the Prairie Project (Lawson, 2013).

Ozark big-eared bat

The proposed action was designed to totally incorporate all Forest-wide standards and direction provided by the USFWS related to the conservation of all listed bat species.

There are no foreseeable additional activities in the area (not associated with this project) that would directly or indirectly affect the Ozark big-eared bat population as a whole, or cause additive or synergistic adverse cumulative impacts in conjunction with the proposed action.

With implementation of Forest-wide standards from the LRMP which were developed in coordination with the USFWS during the revision process, the determination of effect for the Ozark big-eared bat related to this proposed project is: “may affect – not likely to adversely affect.”

Gray bat

There are no foreseeable additional activities in the area (not associated with this project) that would directly or indirectly affect the gray bat population as a whole, or cause additive or synergistic adverse cumulative impacts in conjunction with the proposed action.

With implementation of Forest-wide standards from the RLRMP which were developed in coordination with the USFWS during the revision process, the determination of effect for the Gray bat related to this proposed project is: “may affect – not likely to adversely affect.”

Indiana bat

There are no foreseeable additional activities in the area (not associated with this project) that would directly or indirectly affect the Indiana bat population as a whole, or cause additive or synergistic adverse cumulative impacts in conjunction with the proposed action.

With implementation of Forest-wide standards from the RLRMP which were developed in coordination with the USFWS during the revision process, the determination of effect for the Indiana bat related to this proposed project is: “may affect – not likely to adversely affect.”

Implementation of this proposed project may benefit Ozark big-eared bat, gray bat and Indiana bat by providing habitat improvement. Because there are no other threatened or endangered species or associated habitat present the proposed project would have no effect on any other listed or proposed species (Lawson, 2013).

Sensitive Species

For sensitive species, (Bachman’s sparrow, bald eagle, Eastern small-footed bat, lirceus isopod, Ouachita leadplant, Bush’s poppymallow, Ozark chinquapin, Southern lady’s slipper, Moore’s larkspur, Ouachita mountain goldenrod, Ozark spiderwort, Ozark Chinquapin, and Nuttall’s cornsalad) direct negative impacts to individuals of these species may occur through implementation of the project. No negative indirect or cumulative impacts are expected for these species from implementation of the project. For all Region 8

sensitive species, implementation of the proposal would not lead to the federal listing of these species under the Endangered Species Act. Furthermore, there would be no loss of population viability for these species due to implementation of this project.

Implementation of this proposed project would indirectly benefit sensitive species which require open (unshaded) and/or fire-dependent habitats. These sensitive species include Bachman's sparrow, Ouachita leadplant, Bush's poppymallow, Moore's larkspur, Ozark spiderwort, and Nuttall's cornsalad. Because there were no other sensitive species or habitat for such species present, the project would have no impact on any other Southern Region sensitive species (Lawson, 2013).

Alternative 2
No negative adverse effects would occur to federally listed threatened and endangered species populations (Ozark big-eared bat, gray bat and Indiana bat). Potential positive effects to these species through habitat improvement would not occur.

No negative adverse effects would occur to Region 8 sensitive species (Bachman's sparrow, bald eagle, Eastern small-footed bat, lirceus isopod, Ouachita leadplant, Bush's poppymallow, Ozark chinquapin, Southern lady's slipper, Ouachita mountain goldenrod, Ozark spiderwort,and Nuttall's cornsalad). Potential positive effects to species which require open (unshaded) and/or fire-dependent habitats would not occur. These sensitive species include Bachman's sparrow, Ouachita leadplant, Bush's poppymallow, Ozark spiderwort, and Nuttall's cornsalad.

N. HUMAN HEALTH FACTORS

Existing Condition

The analysis area for human health factors is the area comprised of Compartments 1, 14, 55, and 56. There are no risks to human health from the use of herbicides or cutting tools in the project area. Dead and dying trees along traveled roadways and in camping/hunting areas in the analysis area may give pause for concern for forest workers and visitors. Falling trees and limbs can cause personal injury and damage personal property. Accumulations of forest litter in the analysis area creates a potential for wildfires.

Alternative 1
Alternative 1 proposes the use of triclopyr ester, triclopyr amine and imazapyr for site preparation and release. Imazapyr, imazapic, triclopyr amine, and glyphosate is proposed for use in non-native invasive species treatment and wildlife opening restoration. Triclopyr amine and imazapyr is proposed for use in wildlife stand improvement.

The most current Human Health and Ecological Risk Assessments available for each of the chemicals being proposed for use in this alternative were reviewed during the preparation of this document (Syracuse Environmental Research Associates 2011a, 2011b, 2011c, 2004). These assessments describe in narrative form the relative level of risk for human and ecological factors for a given application rate of the herbicide. These assessments are supported by the accompanying risk assessment worksheets which document the calculations used in the assessments. If needed, worksheets can also be used to analyze the level of risk for specific application rates.

The proposed application rates for each herbicide in this alternative fall at or below the range of rates examined in these risk assessments. The proposed rate of triclopyr (0.75 a.i./acre) is below or equal to the amount of active ingredient (a.i.) per acre analyzed in the risk assessment. The lowest rate analyzed in the imazapyr risk assessment was 0.45 lbs. a.i./ac.; the highest rate proposed in this alternative is 0.3 lbs. a.i./ac. Glyphosate treatment in this alternative is proposed for up to 1.5 lbs. acid equivalent (a.e.)/ac. being applied, the risk assessment analyzed 2.0 lbs. a.e./ac. Imazapic treatment in this alternative is proposed for up to 0.125 lbs. a.e./acre being applied. The risk assessment analyzed 0.1 lbs. a.e./acre with a range of 0.0325 to 0.1875 lbs. a.e./acre. Therefore, no additional worksheets were prepared for any of these herbicides.

The Hazard Quotient (HQ) is a measure of the relative hazard of a proposed action. Risk assessment worksheets calculate the HQ. The risk assessment uses the HQ to address acute exposure, which could result in direct or indirect effects, and chronic exposure, which could result in cumulative effects. The U.S.

Department of Agriculture - Forest Service, Southern Region standard for acceptable level of risk requires a HQ less than 1.0. For human safety, the risk assessments examine the level of risk to workers applying herbicide and to the general public. Workers could be exposed during accidents or general exposure during herbicide application. The general public could be exposed by direct spray of individuals in treatment areas; skin contact with contaminated vegetation; or consumption of contaminated fish, fruit, vegetation, or water. HQs are calculated for exposed women and children as they are considered to have the most potential for adverse effects, and represent the worst-case scenario when analyzing potential for human health effects.

The risk characterization for the herbicides being proposed for use are:

Triclopyr

There is no indication that workers would be subject to hazardous levels of triclopyr at the typical application rate of 1.0 lb./ac. and under typical exposure conditions. Nonetheless, at the upper range of exposures, all application methods exceed the level of concern based on the chronic reference dose (RfD) but not the acute RfD. Thus, for workers who may apply triclopyr repeatedly over a period of several weeks or longer, it is important to ensure that work practices involve reasonably protective procedures to avoid the upper extremes of potential exposure. At higher application rates, particularly rates that approach the maximum application rate of 10 lbs./ac., measures should be taken to limit exposure. These measures would need to be developed on a case-by-case basis depending on the specific application rates that are used and the type of the applications that are employed.

For members of the general public, the risk characterization for triclopyr is thus relatively unambiguous at the typical application of 1.0 lb/acre: based on the available information and under the foreseeable conditions of exposure, there is no route of exposure or exposure scenario suggesting that the general public would be at risk from longer-term exposure to triclopyr (Syracuse Environmental Research Associates 2011a). Even at the maximum projected application rate of 10 lbs/acre, the only longer-term scenario that exceeds the level of the concern is the consumption of contaminated fruit. This is a standard scenario used in all Forest Service risk assessments and is extremely conservative – i.e., it assumes that fruit that has been directly sprayed is harvested and consumed for a prolonged period of time and that the contaminated fruit accounts for 100% of the individuals consumption of fruit. Under these extreme conditions, the level of concern is exceeded by a factor of 5 at the upper range but not the central estimate of exposure. Several acute exposures also lead to hazard quotients that are above the level of concern at the upper range of exposure. Two dermal exposures to triclopyr (ester formulation) – i.e., accidental spray of a woman over the lower legs as well as dermal contact with contaminated vegetation by a woman – exceed the level of concern at the central estimate of exposure. The use of the highest application under consideration – i.e., 10 lbs/acre – alters the risk characterization for acute exposures terms of dermal exposures and the spill into a pond. At an application rate of 10 lbs/acre, both triclopyr ester and triclopyr amine formulations would exceed the level of concern for all dermal exposure scenarios at the upper range of exposure as well as some central estimates of exposure. Again, all of these dermal exposure assessments are extremely conservative and designed to identify which possible types of exposure would be most hazardous. For triclopyr, such scenarios include dermal contact and accidental spills into water.

Imazapyr

Typical exposures to imazapyr do not lead to estimated doses that exceed a level of concern for either workers or members of the general public at either the typical (0.45 lb/ac) or highest application rate (1.25 lb/ac) (Syracuse Environmental Research Associates, 2011b). Although there are several uncertainties in the exposure assessments for workers and the general public, the upper limits for hazard quotients associated with the longer-term exposures are sufficiently below a level of concern that the risk characterization is relatively unambiguous. Based on the available information and under the foreseeable conditions of application, there is no route of exposure or scenario suggesting that the workers or members of the general public would be at any substantial risk from longer-term exposure to imazapyr even at the upper range of the application rate considered in this risk assessment.

Mild irritation to the eyes can result from exposure to relatively high levels of imazapyr. From a practical perspective, eye irritation is likely to be the only overt effect as a consequence of mishandling imazapyr. This effect can be minimized or avoided by prudent industrial hygiene practices – e.g., exercising care to reduce splashing and wearing goggles – during the handling of the compound.

Glyphosate

The risk characterization for both workers and members of the general public for glyphosate is reasonably consistent in unambiguous (Syracuse Environmental Research Associates, 2011c). For both groups, there is very little indication of any potential risk at the typical application rate of 2 lbs a.e./acre. Even at the upper range of plausible exposures in workers, most hazard quotients are below the level of concern.

For workers, the highest hazard quotient – i.e., 0.2, the upper range for workers involved in broadcast ground spray – is below the level of concern by a factor of about 5. The highest hazard quotient for any accidental exposure scenario for workers - i.e., 0.006 for the upper range of the hazard quotient for spill over the lower legs for one hour - is lower than the level of concern by a factor of over 150. Confidence in these assessments is reasonably high because of the availability of dermal absorption data in human as well as worker exposure studies. The Forest Service may apply glyphosate at a maximum rate of 7 lbs a.e./acre, a factor of 3.5 higher than the typical application rate of 2 lbs a.e./acre. This has essentially no impact of the risk characterization for workers. The highest hazard quotient for the typical application rate is 0.2. For an application rate of 7 lbs a.e./acre, the corresponding hazard quotient would be higher by a factor of 3.5 or 0.7, which is still below the level of concern.

From a practical perspective, the most likely accidental exposure for workers that might require medical attention involves accidental contamination of the eyes. Glyphosate and glyphosate formulations are skin and eye irritants. Quantitative risk assessments for irritation are not normally derived, and, for glyphosate specifically, there is no indication that such a derivation is warranted. Glyphosate with the polyoxyethyleneamine (POEA) surfactant is about as irritating as standard dishwashing detergents, all-purpose cleaners, and baby shampoos. As with the handling of any chemical, including a variety of common household products, reasonable care should be taken to avoid contact of skin and eyes.

The only area of remarkable uncertainty involving worker exposures concerns the potential health effects during brown-and-burn operations. The combustion of wood and wood by-products may produce a number of toxic compounds. This is a concern with brown-and-burn operations but does not pertain to the use of glyphosate or any other herbicide. The potential effects of combustion products is common to all risk assessments of materials that might be subject to burning. With the exception of some plastics, the combustion products of which are known to pose a risk to fire fighters, the combustion products of most chemicals have not been examined in detail. The necessity of addressing this data gap must be weighed against the need to address other data gaps on glyphosate and other chemicals. The combustion products of burning wood and vegetation are respiratory irritants as well as carcinogens, and exposure to these combustion products should be avoided. There is no basis for believing that the presence of low or even high levels of glyphosate residues would have a considerable impact on this hazard.

For members of the general public, none of the longer-term exposure scenarios exceed or even approach a level of concern. Although there are several uncertainties in the longer-term exposure assessments for the general public, the upper limits for hazard indices are below a level of concern by factors of about 25 (longer term consumption of contaminated fruit) to over two million (2,500,000 for longer-term consumption of fish by the general population). The risk characterization is thus relatively unambiguous: based on the available information and under the foreseeable conditions of application and exposure, there is no route of exposure or exposure scenario suggesting that the general public would be at risk from longer-term exposure to glyphosate. As with the hazard characterization for workers, an application rate of 7.5 lbs a.e./acre makes no difference in the assessment of potential risks. At this application rate, the highest hazard quotient would be about 0.14 [0.04 × 3.5], which is still below a level of concern by a factor of about 7.

One acute exposure scenario does exceed the level of concern at the upper range at the typical application rate of 2 lbs a.e./acre. The exposure scenario for the consumption of contaminated water after an accidental spill into a small pond results in an excursion above the RfD at the upper limit of exposure – i.e, a hazard quotient of 2. This exposure scenario is extreme to the point of limited plausibility. This sort of scenario is routinely used in Forest Service risk assessments as an index of the measures that should be taken to limit exposure in the event of a relatively large spill into a relatively small body of water. For glyphosate, as well as for most other chemicals, this exposure assessment indicates that such an event would require measures to ensure that members of the general public do not consume contaminated water.

At the highest application rate that might be used in Forest Service programs, the accidental spill scenario is

the only other scenario that results in a hazard quotient above unity. At this application rate, the associated dose is about 14 mg/kg, which is still below the dose of 184 mg/kg associated with no apparent overt effects in humans by a factor of over 10.

Imazapic

Typical exposures to imazapic do not lead to estimated doses that exceed a level of concern. For workers, no exposure scenarios, acute or chronic, exceed the RfD even at the upper ranges of estimated dose. For members of the general public, the upper limits for hazard quotients are below a level of concern except for the accidental spill of a large amount of imazapic into a very small pond. Based on the available information and under the foreseeable conditions of application, there is no rout of exposure or scenario suggesting that workers or members of the general public would be at any substantial risk from longer-term exposure to imazapic.

There is very little information available on the interaction of these herbicides with other compounds. These herbicides are not persistent in the environment or in the human body, so a member of the public or a worker is not likely to be chronically exposed through the Forest Service's program nor receive simultaneous exposures from this herbicide in any other program.

A well-ventilated, fully, developed fire in a wood stove or fireplace where temperatures can reach 800-1000^{oC} can produce virtually complete decomposition of triclopyr (Bush et. al., 1987). Under conditions of rapid flaming combustion, triclopyr decomposed readily, with high temperatures causing almost complete decomposition. Fires producing incomplete combustion (temperatures<50^{oC}) can result in the evolution of trace pesticide residues in smoke and combustion gases. However, the levels of herbicide residue evolved and potentially absorbed systemically are well below levels that are judged by regulatory agencies to be safe to ingest on a daily basis.

Worker exposure assessments and field studies of triclopyr and imazapyr have shown that risk from herbicide exposure to forest workers under "brown and burn" conditions is small, even if the fire occurs immediately after herbicide application, as might occur in a wildfire (Bush et.al, 1998). Thus, use of herbicides in combination with fire in site preparation, under-story vegetation management, or creating wildlife habitat/openings does not increase human exposure over risks associated with fire alone.

Injuries to the back, hand, and skin predominate in accidents involving vegetation management. Vegetation management activities with the greatest risks to the average worker in a 25-year career are those connected with site preparation. This is evidenced by high workers' compensation insurance rates for this type of work. There would be no effect to the forest visitor from mechanical methods since the visitor would not be present when this work is done.

Smoke

Prescribed burning for fuels reduction would reduce the risk of wildfire within the Wildland Urban Interface in this area. Occasional brief exposure of the general public to low concentrations of drift smoke is more a temporary inconvenience than a health problem. High smoke concentrations can, however, be a very serious matter, particularly near homes of people with respiratory illnesses or near health-care facilities. Prescribed burning proposed for this project would meet the standards established for the National Ambient Air Quality Standards as discussed in the Air Quality section of this EA.

Smoke can have negative short-and long-term health effects (Wade and Lunsford, 1988). Fire management personnel who are exposed to high smoke concentrations often suffer eye and respiratory system irritation. Under some circumstances, continued exposure to high concentrations of carbon monoxide at the combustion zone can result in impaired alertness and judgment. The probability of this happening on a prescribed fire is, however, virtually nonexistent.

Over 90 percent of the particulate emissions from prescribed fire are small enough to enter the human respiratory system. These particulates can contain hundreds of chemical compounds, some of which are toxic. The repeated, lengthy exposure to relatively low smoke concentrations over many years can contribute to respiratory problems and cancer. But, the risk of developing cancer from exposure to prescribed fire has been estimated to be less than 1 in a million (Wade and Lunsford, 1988).

In general, the public, with the exception of the very ill, very young, and the elderly, have a low risk of long-term chronic health impacts, such as asthma, pulmonary disease or other respiratory diseases from prescribed burns (Sandberg and Dost 1990). This is due in part to the short exposure times, typically 15 hours or less, at concentrations that are below the NAAQS.

Herbicides proposed in this alternative break down rapidly in the soil. Both theoretical calculations and field studies suggest that prescribed fires are hot enough to destroy any chemical residues. Minute quantities that may end up in smoke are well within currently-accepted air quality standards. Threshold limit values (TLVs) are often used to measure the safety of herbicide residues in smoke. Expected exposure rates of workers to various brown-and-burn combinations have been compared with TLVs. They showed virtually no potential for harm to workers or the general public.

There is at least one group of compounds carried in smoke that can have an immediate acute impact on individuals. When noxious plants such as poison ivy burn, the smoke can cause skin rashes. These rashes can be much more widespread on the body than those caused by direct contact with the plants. If this smoke is inhaled, respiratory systems can also be affected.

Alternative 2
There would be no change from the existing condition regarding risks to human health from the use of herbicides, prescribed burning, or cutting tools. Risks to human health and safety from falling limbs and trees would remain stable or increase. Accumulations of forest litter in the analysis area would continue to create a potential for wildfires.

O. ECONOMICS AND SOCIAL ENVIRONMENT

Existing Condition

The project area lies within Yell County. Yell County was used as the analysis area for economic and social effects.

The economy of Yell County is summarized in the table below.

The 2011 total population estimate of Yell County was 22,060 people (U.S. Census Bureau, 2011c). In 2000, the population 16 years and over in the labor force for Yell County was 9,814. Of these numbers of people, forty-four in Yell County were in the Armed Forces and the remainder was in the civilian labor force. Approximately 9,056 people were employed in the civilian labor force with 714 being unemployed.

Table 22 shows the occupation of the employed civilian labor force (U.S. Census Bureau, 2011c).

Table 22: Yell County Civilian Labor Force Occupations.

Description	Yell County	
	Number of Employees	Percent of Total Employees
Management, Professional, and Related Occupations	1695	18.7
Service Occupations	1547	17.1
Sales and Office Occupations	2011	22.2
Forestry, Construction, and Maintenance Occupations	1348	14.9
Production, Transportation, and Material Moving Occupations	2455	27.1

Table 23 shows the income for Yell County (U.S. Census Bureau, 2011c).

Table 23: Yell County Household Income.

Income in Dollars	Yell County	
	Number of Households	Percent of Households
Less than $10,000	634	8.0
$10,000 to $14,999	642	8.1
$15,000 to $19,999	729	9.2
$20,000 to $24,999	602	7.6
$25,000 to $34,999	1078	13.6
$35,000 to $49,999	1427	18.0
$50,000 to $74,999	1411	17.8
$75,000 to $99,999	840	10.6
$100,000 to $149,999	357	4.5
$150,000 or more	206	2.6
Median household income (dollars)	$37,477	

The total land area of Yell County is estimated at 595,187 acres (U.S. Census Bureau, 2011a). Ozark and Ouachita National Forest lands comprise 221,469 acres of land in Yell County. This means that 37% of the taxable land base of Yell County is in National Forest and not subject to property taxes.

In addition to the percentage of jobs and income generated by forest industries, a portion of county roads and school budgets is funded from generated income on National Forest lands within the counties. These two sources are Payments in Lieu of Taxes (PILT) and Title I of the Secure Rural Schools and Self-Determination Act (SRS). Yell County received $326,178 from the PILT program in Fiscal Year 2011 (U.S. Department of Interior, 2011) and $720,546 from the SRS (U.S. Department of Agriculture - Forest Service, 2011).

The Ozark-St. Francis FEIS for the RLRMP estimated benefits, costs, net benefits, and cumulative present net value (FEIS pgs. 3-454 – 3-456). The benefits included market values and non-market estimated values. Market values included those values for which the Forest Service receives money such as minerals, timber, range, and special uses. Non-market values are estimated values for amenities such as wildlife and recreation. Over a 50-year analysis period, the Benefit/Cost ratio for all resource activities (in the selected LRMP alterative) was 1.59. The Benefit/Cost ratio for the timber management program alone was 1.35 (Ozark-St. Francis FEIS - Table 3-228, p. 3-455). A B/C ratio of more than 1.0 represents a positive net benefit. Therefore, timber management on the Ozark NF was shown to be cost effective. When combined with the benefits of non-commodity resources that accompany timber harvesting, the overall benefits to the public are even greater.

Traditional uses of this area are discussed under Recreation beginning on page 56.

Effects

Alternative 1
An economic analysis of proposed activities for each alternative was prepared. Calculations are part of the process documentation.

Table 24 is a comparison of the economic analysis for all alternatives. Present Net Value (PNV) is calculated and is used as an indicator of the efficiency of the project.

***Table 24: Comparison of Economic Analysis for all Alternatives.*[1]**

Action	Alternative 1	Alternative 2
Present Value Revenues	$ 1,263,881	$ 0
Present Value Costs	$ 861,780	----0
Net Present Value	$ 402,101	$ 0
B/C Ratio	1.47	----

[1]All measures are approximations.

The following assumptions were made for this analysis:

(1) The time frame for this economic analysis begins with project decision and continues through the project planning cycle (10 years).

(2) Calculations, which considered the time value of costs and revenues for each alternative, were used to determine net present value. Quick-Silver, a project analysis tool developed by the U.S. Forest Service, was used to determine the economic performance of long-term investments for this project. A 4% discount rate was used for this analysis. Results are shown in Table 21, page 92.

(3) The B/C ratio for each alternative in Table 21 reflects revenues generated from timber harvesting and hunting generated by wildlife management. The action alternative had a B/C ratio greater than 1.0 resulting in a positive net benefit. The dollars generated by dispersed recreation and tourism would not be affected by activities in the alternative.

The revenues derived from the selling price of timber would contribute to school and road funds in Yell County.

Social effects on public health, recreation, and visual quality are discussed under these headings in the EA.

Alternative 2
No money would be spent by, or returned to, the Federal Government. No additional employment in the timber industry would occur, nor would potentially available intermediate age and maturing trees contribute to maintaining jobs that already exist. Some employment may actually be lost. No firewood from these areas would be available to local people for home heating purposes. Some standing timber, and the corresponding expected potential economic returns, would be lost with the mortality of some trees. Wildlife habitat condition would remain essentially static, deteriorating for some game and non-game species, while improving slightly for others.

Yell County would still receive a payment under the PILT and the SRS programs. However, under the SRS

program, the potential amount that would be returned to all counties in Arkansas containing Ozark-St. Francis National Forest lands would be reduced because no revenues from timber sales in these compartments would be contributed toward the Forest's total amount of timber sale revenue generated.

Social effects on public health, recreation, and visual quality are discussed under these headings in the EA.

P. ENVIRONMENTAL JUSTICE AND CIVIL RIGHTS

Yell County was used as the analysis area for environmental justice and civil rights effects.

The population of Yell County in 2010 was 22,353 (U.S. Census Bureau, 2011d). Table 25 shows the breakdown in demographics for the county and for Arkansas as a whole in 2010 (U.S. Census Bureau 2011c).

Table 25: Year 2010 Population Demographics for Yell County and Arkansas.

Race	Yell County	Arkansas
White	94.5%	80.1%
Black or African American	1.9%	15.6%
American Indian and Alaska Native	0.9%	0.9%
Asian	1.5%	1.3%
Native Hawaiian and Other Pacific Islander	0.1	0.2%
Persons of Hispanic or Latino Origin	19.2%	6.6%
Person reporting two or more races	1.2%	1.8%

The percent of persons below the poverty level in 2000-2011 in Yell County was 18.5% (U.S. Census Bureau, 2011a). The state's level as a whole was 18.4% (U.S. Census Bureau, 2011a) making Yell County poverty average comparable with the state as a whole.

Using these figures as a basis for analysis, there would be no disproportionate effects to these minority groups resulting from the alternatives.

Civil rights implications were considered related to each alternative. This included the effects of the alternatives on minority groups, women, and consumers. Civil rights imply the fair and equal treatment under law, both within the agency and in relations with the public. No potentially major civil rights impacts were found related to any alternative. Therefore, a civil rights impact analysis and statement of findings are not required for this project.

IV. CONSULTATION AND COORDINATION

The Forest Service consulted the following individuals, Federal, Tribal, State, and local agencies during the development of this environmental assessment:

ID Team Members:

Mary Brennan; Zone Archeologist; Boston Mountain/Pleasant Hill/Mt. Magazine Ranger Districts; Ozark National Forest; Clarksville, Arkansas

Mark Burge; Timber Management Assistant; Mt. Magazine Ranger District; Ozark National Forest; Paris, Arkansas

Ron Burrow; Law Enforcement Officer; Mt. Magazine Ranger District; Ozark National Forest; Paris, Arkansas

Richard Carpenter; Wildlife Technician; Mt. Magazine Ranger District; Ozark National Forest; Paris, Arkansas

Jason Davis; Civil Engineering Technician; Mt. Magazine Ranger District; Ozark National Forest; Paris, Arkansas

Coyle Ellingberg; Timber Sales Administrator; Mt. Magazine Ranger District; Ozark National Forest; Paris, Arkansas

Mindi Lawson; Wildlife Biologist; Mt. Magazine Ranger District; Ozark National Forest; Paris, Arkansas

Richard Monk; Forest Hydrologist; Ozark-St. Francis National Forest; Russellville, AR

David Moore; Lead Timber Marker; Mt. Magazine Ranger District; Ozark National Forest; Paris, Arkansas

Steve Overton; ID Team Leader

Joy Serrano; Outdoor Recreation Planner; Mt. Magazine Ranger District; Ozark National Forest; Paris, Arkansas

Chip Stokes; GIS Technician; Mt. Magazine Ranger District; Ozark National Forest; Paris, Arkansas

Gina Tatum; Silvicultural Technician; Mt. Magazine Ranger District; Ozark National Forest; Paris, Arkansas

John Thias; Forester; Mt. Magazine Ranger District; Ozark National Forest; Paris, Arkansas

Len Weeks; Forest Soil Scientist; Ozark-St. Francis National Forest; Russellville, Arkansas

Keith Whalen; Fisheries Biologist; Ozark-St. Francis National Forest; Russellville, Arkansas

Federal, Tribal, State, and Local Agencies:

Mark Thone; Yell County Judge

Anita Chouinard; Arkansas Dept. of Parks and Tourism

Randy Roberson; Arkansas State Parks

Arkansas State Historic Preservation Office

Colby Wells; Wildlife Technician; Mt. Magazine Wildlife Management Area; Arkansas Game and Fish Commission; Paris, Arkansas

Kevin Lynch; Biologist; Arkansas Game and Fish Commission; Fort Smith, Arkansas

Henrietta Ellis; Absentee Shawnee Tribe of Oklahoma; Shawnee, Oklahoma

Robert Cast; Caddo Nation of Oklahoma; Binger, Oklahoma

Richard Allen; Cherokee Nation of Oklahoma; Tahlequah, Oklahoma

Tamara Francis; Delaware Nation; Anadarko, Oklahoma

Robin Dushane; Eastern Shawnee Tribe; Seneca, Missouri

Jean Ann Lambert; Quapaw Tribe; Fayetteville, Arkansas

Dr. Andrea Hunter; Osage Nation; Pawhuska, Oklahoma

Lisa LaRue Stopp; United Keetoowah Band of Cherokee Indians; Tahlequah, Oklahoma

APPENDIX A. RESOURCE MAPS.

Map 6: Scenic Integrity Objective Map

Map 7: Recreation Opportunity Spectrum Map

Map 8: Forest Type Map

Map 9: Age Class Distribution Map

Map 10: Stand Map

Map 11: Watershed Map

Map 12: Management Areas

APPENDIX B. SOILS

Map 13: Soil Type Map

APPENDIX C. TRANSPORTATION SYSTEM
Alternative 1

Road	Current Status	Miles	Future Status	Miles	Decommissioned
Spring Lake Road	Open	6.4	Open	6.4	
1602A	Open	0.9	Open	0.9	
1602AR – Boat Ramp	Closed	0.1	Closed	0.1	
1602B	Closed	0.2	Closed	0.2	
1618A	Open	0.7	Open	0.7	
1625	Open	1.1	Open	1.1	
1625A	Closed	0.3	Decommissioned		0.3
1632	Open	1.9	Open	1.9	
1632A	Closed	0.8	Decommissioned		0.8
1632B	Closed	0.7	Decommissioned		0.7
1632C	Open Closed	0.9 0.5	Open	1.4	
1639	Open Closed	1.2 0.9	Open Decommissioned	1.2	0.9
1640	Open Closed	0.6 0.4	Open Closed	0.6 0.4	
1640A	Open	1.0	Open	1.0	
96001A	Closed	1.5	Closed	1.5	
96001B	Closed	0.1	Closed	0.1	
96001C	Open	0.5	Open	0.5	
96001D	Open	0.2	Open	0.2	
96001E	New Construction	0.0	Closed	0.6	
96001F	Closed	0.2	Open	0.2	
96014A	Closed	0.4	Decommissioned		0.4

Road	Current Status	Miles	Future Status	Miles	Decommissioned
96014B	Closed	0.8	Closed Decommissioned	0.3	 0.5
96055D	Closed	0.6	Decommissioned		0.6
96055F	Closed	0.6	Decommissioned		0.6
96055G	Closed	0.4	Decommissioned		0.4
TOTAL		**23.0**		**19.3**	**5.2**

Alternative 2

The status of roads for this alternative would be the same as the current status listed in Alternative 1.

APPENDIX D. TACCIMO Ozark

APPENDIX E. PROPOSED ACTION COMMENT PERIOD COMMENTS AND RESPONSES.

The Draft Prairie EA appeared in the *Times Record* newspaper, the paper of record on May 1, 2013. This began the 30 day comment period for the draft EA.

A copy of the draft EA was posted that same week on the Ozark-St. Francis National Forests website at http://www.fs.fed.us/oonf/ozark/projects/planning/magproject.html.

This project was also listed in the Schedule of Proposed Actions and posted on the Ozark-St. Francis National Forests website at http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5291930.pdf

One public response was received from this comment period.

Comments are shown below followed by a Forest Service response.

1. Comment: Deputy Ranger Kopack, it's past time for you to deal with your denial of what a 35,000 pound piece of industrial equipment with spinning wheels and track does to the fragile forest ecosystem. Many Americans are learning that the USDA serves corporate America, not the American public.

Response: Forest plan standards designed to minimize impacts to soil are in place and will be followed. They can be found on pages 3-1 through 3-13 of the Revised Land and Resources Management Plan (RLRMP).

2. Comment: Please include (and cite) the source documents for the opposing views contained in the attachments to these comments in the References section of the final EIS. When describing the environmental effects of the timber sale activities to the countless natural resources in the project area please cite the resource damage described in the source documents contained in the attachments. Withholding the truth from the public to further the USFS timber agenda is not only unprofessional and unethical, is illegal.

Response: We are using the best available science when addressing environmental effects associated with our ecosystem management.

3. Comment: Deputy Ranger Kopack, you choose to reject the research conclusions of many independent, unbiased scientists. Instead, you choose to take the advice of USFS timber employees who are paid to "get out the cut." Please tell the public why you believe your TMA and/or the forest Timber Staff Officer and reject the findings of experts with no financial gain whether the sale is offered or not.

Response: Activities proposed within this project have been evaluated against their impacts to the environment. This project is similar to several projects previously implemented. No long-term damaging environmental impacts have been observed during or after the implementation of the previous projects.

4. Comment: Please comply with 40 C.F.R. § 1502.9(a) by responding to each opposing view in **Attachments #1 and #4.**

Response: 40 CFR 1502.9(a) is referring to environmental impact statements. This project is being prepared as an environmental assessment since this project does not contain any actions that would result in a significant direct, indirect or cumulative effect that could not be mitigated. Proposed actions with this project area are considered specific in scope and do not preclude meaningful analysis. Attachments #1 and #4 were not included in your response.

5. Comment: The References section of this pre-decisional EA identifies (and cites) many documents that have not been peer reviewed.

Response: This comment is not specific. In the future, please let us know what documents you are questioning.

6. Comment: There is a standard literary standard to inform the public that documents have been peer reviewed. Government documents have peer-review requirements issues by the White House Office of

Management and Budget (OMB). The link to these requirements is:
http://en.wikipedia.org/wiki/U.S._Government_peer_review_policies
This member of the public has checked the documents cited in the References section and more than a few do not meet these requirements.

Response: Office of Management and Budget's (OMB) peer review bulletin requires that US federal regulatory agencies submit all "influential scientific information" to peer review before the information is publicly disseminated. The Bulletin defines "scientific information" as:

"factual inputs, data, models, analyses, technical information, or scientific assessments related to such disciplines as the behavioral and social sciences, public health and medical sciences, life and earth sciences, engineering, or physical sciences."

This Bulletin defines "influential scientific information" as

"scientific information the agency reasonably can determine will have or does have a clear and substantial impact on important public policies or private sector decisions. In the term 'influential scientific information,' the term 'influential' should be interpreted consistently with OMB's government-wide information quality guidelines and the information quality guidelines of the agency."

This document is not impacting public policies or private sector decisions.

7. Comment: Deputy Ranger Kopack, why has it never occurred to you that the fix is in? Most documents cited in your References are authored by USDA employees, in spite of the fact that the vast majority of scientific literature describing the ecological effects of logging were written by independent scientists unaffiliated with the USFS.

Response: We are using the best available science most relevant to this project.

8. Comment: The vast majority of trees that die in the forest must stay in the forest to sustain the natural functioning of the resources in the forest. Its sad that some USFS employees believe trees on public land that die are wasted unless the are hauled to the mill.

Response: Some trees that die are harvested, but those are mostly along roadsides which if left alone could later on pose a threat to public safety if they were to fall into the road. Typically, trees that die more than 100 feet from the roadway are not salvaged and therefore are left to be utilized by animals and insects. Your concern for nutrient cycling is appreciated. Most nutrients in trees are tied up in leaves, limbs and roots that are left in the forest. See page 36 of the EA. Documentation of this process has been added to the final EA.

9. Comment: The wildlife species' whose habitat exists **only** in forests with unhealthy trees and/or climax tree species will be harmed when this timber sale is logged. Where will these species go to find other suitable habitat?

Response: A viability assessment for plants and animals on the forest was completed. This assessment was conducted with species experts in Arkansas and is documented in Appendix D of the FEIS for the RLRMP. Treatments in the project were evaluated in the Viability Assessment and needs for species with viability concerns will be provided for. In fact restoration of pine woodland in this project is important to provide for several species with viability concerns.

10. Comment: Too many USFS line-officers equate forest health with conifer tree health. They look the other way when their so-called forest health treatments harm countless natural resources in the forest. Logging and road construction degrade aquatic resources … this sale included. The American public does not believe logging is worth the harm.

Response: This is not specific to the Prairie project.

11. Comment: Please comply with 40 C.F.R. § 1502.9(a) by responding to each opposing view in **Attachments #5, #8 and #14.** Remember, the only location where tax dollars should be spent to stop natural disturbance events (in this case fire) is near the WUI.

Response: 40 CFR 1502.9(a) is referring to environmental impact statements. This project is being prepared as an environmental assessment since this project does not contain any actions that would result in a significant direct, indirect or cumulative effect that could not be mitigated. Proposed actions with this project area are considered specific in scope and do not preclude meaningful analysis.

12. Comment: Numerous United States laws tell USFS line-officers that they must not propose a project anywhere for any reason that will harm the environment for the short or long-term as this one will do. Providing forest products to the local community must be an outcome … not a reason for logging!

Response: Production of forest products as a result of this EA and Decision are a result of vegetation and ecosystems management.

13. Comment: The public does not want the Responsible Official to provide corporate gifts at the expense of their public land.

Response: Actions proposed within this project are designed for the benefit of the ecosystem not corporations as you imply.

14. Comment: Duh!

Response: Your comment is too vague for a response.

15. Comment: If the Responsible Official really wants to eliminate the sediment originating from temporary roads he will obliterate all temporary roads after use and say this will be done in the final EA.

Response: Temporary roads, primary skid trails, and landings would be disked, seeded and closed following harvesting to speed the recovery of the soil productivity. See page 35.

16. Comment: The public living in the WUI wants to know why you place merchantable tree removal actions described in the Purpose & Need more important than human lives. Much of your P&N describes what a private industrial tree farm manager would strive to do on the land under his/her control. Why does mimicking private industrial tree farm transcend the importance of reducing the risk of homes burning?

Response: Tree removal activities described in the EA are designed to promote forest health and promote fauna and flora diversity. A secondary benefit of implementing the proposed action will be the reduced fuel loading. Reducing the fuel loading will diminish the current potential for a catastrophic wildfire with its inherent risk to human lives and property.

17. Comment: Deputy Ranger Kopack since you ignore the most effective fire damage risk reduction actions in existence today in favor or using the fuels-reduction excuse to "get-out-the-cut" please tell the public your acceptable conversion using human deaths/MBF.

Response: Mr. Artley, this comment is deeply offensive and certainly has no relationship to the Prairie project.

18. Comment: Please comply with 40 C.F.R. § 1502.9(a) by responding to each opposing view in **Attachments #3 and #11.**

Response: 40 CFR 1502.9(a) is referring to environmental impact statements. This project is being prepared as an environmental assessment since this project does not contain any actions that would result in a significant direct, indirect or cumulative effect that could not be mitigated. Proposed actions with this project area are considered specific in scope and do not preclude meaningful analysis.

19. Comment: Dr. Cohen states "*Research results indicate that the home and its immediate surroundings within 100-200 feet (30-60 meters) principally determines the home ignition potential during severe wildland-urban fires*." Why are you spending tax dollars on this fuels timber sale rather than helping the public?

Response: This comment is outside the request for comments on the proposed action as defined in the request for comment letter dated April 30, 2013. The Forest Service publishes a pamphlet "Firewise Landscaping for Woodland Homes," that explains to landowners how to protect their dwellings from possible ignition should a wildfire threaten their property.

20. Comment: Dr. Cohen states "*Extensive wildland vegetation management does not effectively change home ignitability."* How does the Blowdown timber sale differ such that his conclusion is not true in the timber sale location?

Response: The Forest Service manages National Forest lands and private property owners manage their land and property.

21. Comment: Dr. Cohen states "*Vegetation management beyond the structure's immediate vicinity has little effect on structure ignitions."* How does the Blowdown timber sale differ such that his conclusion is not true in the timber sale location?

Response: Vegetation management does affect intensity of fires, probability of developing crown fires and ability of fires to send burning embers ahead of the fire front. All of these factors affect the probability of stopping the spread of wildfire. Burning embers can directly start a house fire.

22. Comment: Dr. Cohen states "*Past reports and recommendations as well as experimental research and modeling suggest that W-UI fire-loss mitigation should concentrate on the residence and its immediate surroundings.* How does the Blowdown timber sale differ such that his conclusion is not true in the timber sale location?

Response to Comments 22 - 33: Vegetation management does affect intensity of fires, probability of developing crown fires and ability of fires to send burning embers ahead of the fire front. All of these factors affect the probability of stopping the spread of wildfire. Burning embers can directly start a house fire.

23. Comment: Dr. Cohen states "*wildland fuel reduction does not necessarily mitigate the W-UI fire loss problem."* How does the Blowdown timber sale differ such that his conclusion is not true in the timber sale location?

24. Comment: Dr. Cohen states "*Effective landscape fuel reduction does not necessarily prevent W-UI home fire destruction."* How does the Blowdown timber sale differ such that his conclusion is not true in the timber sale location?

25. Comment: Dr. Cohen states "*wildland fuel reduction that is effective for reducing the wildland fire intensity might be insufficient for reducing the destruction of highly ignitable homes."* How does the Blowdown timber sale differ such that his conclusion is not true in the timber sale location?

26. Comment: Dr. Cohen states "*Vegetation management to prevent ignitions from radiation does not require extensive vegetation removal hundreds of meters from a structure. Our analysis indicated that 40 meters was sufficient for a 20 meter flame height*." How does the Blowdown timber sale differ such that his conclusion is not true in the timber sale location?

27.Comment: Dr. Finney, Dr. Cohen, Dr. Franklin and Dr. Agee agree that *"there are a number of misconceptions and misunderstandings about fuel treatments and their use as a panacea for fire hazard reduction across the United States."* How does the Blowdown timber sale differ such that their conclusion is not true in the timber sale location?

28. Comment: Dr. Cohen states "*It is a misconception to think that treating fuels can "fire-proof" important areas."* How does the Blowdown timber sale differ such that his conclusion is not true in the timber sale location?

29. Comment: Dr. Bessie and Dr. Johnson say *"weather (fuel moisture and wind) is far more important than fuels in determining fire behavior; reducing fuels may have a limited impact on fire occurrence*." How does the Blowdown timber sale differ such that their conclusion is not true in the timber sale location?

30. Comment: Dr. Cohen states "*Treating fuels to reduce fire occurrence, fire size, or amount of burned area is ultimately both futile and counter-productive."* How does the Blowdown timber sale differ such that his conclusion is not true in this timber sale location?

31. Comment: Dr. Cohen states ""*It may not be necessary or effective to treat fuels in adjacent areas in order to suppress fires before they reach homes; rather, it is the treatment of the fuels immediately proximate to the residences."* How does the Blowdown timber sale differ such that his conclusion is not true in this timber sale location?

32. Comment: Dr. Cohen says "*Thinning will often result in increased potential surface fire behavior."* How does the Blowdown timber sale differ such that his conclusion is not true in this timber sale location?

33. Comment: Lertzman et al., 1998; Agee et al. state, "*Some viable fuel treatments may actually result in an increased rate of spread under many conditions.*" How does the Blowdown timber sale differ such that their conclusion is not true in this timber sale location?

34. Comment: Dr. Cohen states "Ecosystem restoration treatment and fuel treatment are not synonymous." How does the Blowdown timber sale differ such that Dr. Cohen's conclusion is not true in this timber sale location?

Response: Vegetation management does affect intensity of fires, probability of developing crown fires and ability of fires to send burning embers ahead of the fire front. All of these factors affect the probability of stopping the spread of wildfire. Burning embers can directly start a house fire. In the case of the Prairie project restoration goals and fuel treatment goals are the same.

35. Comment: Dr. Ingalsbee and Dr. Fox say "logging-induced changes in fuel composition, vegetation, and microclimate can result in increased rate of fire spread, higher fireline intensity, and more severe fire effects." What scientific evidence does the Responsible Official have showing this is untrue?

Response: If a wildfire were to occur right after harvesting is completed then the potential for increased rate of fire spread and higher fireline intensity is a possibility. However, it must be realized that not all acres will be cut at the same time. Therefore, not all acres will not have the potentially higher rate of spread and fireline intensity. Additionally, as areas are prescribed burned after harvesting the threat of a potential increased rate of fire spread and fireline intensity will drop below pre-harvest levels.

36. Comment: The public detests commercial logging in their national forest land, especially when the reason given for the logging does not help them during a wildfire.

Response: Vegetation management does affect intensity of fires, probability of developing crown fires and ability of fires to send burning embers ahead of the fire front. All of these factors affect the probability of stopping the spread of wildfire. Burning embers can directly start a house fire.

37. Comment: The Blowdown timber sale removes fuels to reduce wildfire severity and rate of spread in spite of what Dr. Agee says. Why is his statement that fires are more weather –dependent than fuel-dependent not the case here?

Response to Comments 37 - 41: Yes, fires are dependent upon weather as well as fuels. We cannot control weather but we can control fuels.

38. Comment: The Blowdown timber sale removes fuels to reduce wildfire severity and rate of spread in spite of what Dr. Alison says. Why is his statement that fires are driven by climate and weather not the case here?

39. Comment: The Blowdown timber sale removes fuels to reduce wildfire severity and rate of spread in spite of what Dr. Bessie and Dr. Johnson say. Why are their statements that fires are driven by drought and high winds not the case here?

40. Comment: The Blowdown timber sale removes fuels to reduce wildfire severity and rate of spread in spite of what Dr. Kelly says. Why are Dr. Kelly's statements that fires are driven by drought, wind, and low humidity not the case here? Also how will you replicate the fire benefits to the natural resources that exist in your timber sale area if the fires don't occur?

41. Comment: The Blowdown timber sale removes fuels to reduce wildfire severity and rate of spread in spite of what Dr. Partridge says. Why are Dr. Partridge's statements that fires are driven by temperature and moisture not the case here?

42. Comment: The Blowdown fuels reduction timber sale is precisely what USFS Chief Dombeck says should not occur because the cost is high and it does not reduce the fire damage risk for people living in the WUI.

Response: The treatments in the Prairie project benefit more than fuels. They help sustain the native vegetation and wildlife of the project area.

43. Comment: In the response to comments in the final NEPA document please tell the public why Dr. Schoennagel, Dr. Veblen and Dr. Rommie are wrong when they all agree that "once fuels reached

critical moisture levels later in the season, the spatial pattern of the large, severe stand replacing fires was controlled by weather (wind direction and velocity), not by fuels or stand age."

Response: This is not disputed, nor does the analysis within the EA claim that wind direction and velocity doesn't control the direction of the spread of a wildfire.

44. Comment: Dr. Schoennagel is a research scientist in CU-Boulder's geography department. Her research team included Dr. Cara R. Nelson, Dr. David M. Theobaldc, Dr Gunnar C. Carnwathb, and Dr. Teresa B. Chapmana. The Responsible Official should not ignore their conclusion that most fuels reduction timber sales are located far from the WUI where they are much less likely to reduce the risk that homes located in the WUI will burn.

Response: This project is proposing treatment of all WUI acres within the project area where the terrain does not impose limiting conditions.

45. Comment: The public expects the men and women who they pay to care for their national forests to understand how national policies created by a timber lobbyist (Mark Rey) appointed by bush to increase the cut from national forests is still driving the agency to do things the public abhors.

Response: Public opinion varies across the country. While there is no doubt that some of the public abhors any timber management as you do, yours is the only response to this project that reflects that view. In the counties served by this Ranger District, many people actively manage timber on their own lands and see management of public lands as beneficial.

46. Comment: The Blowdown project directly contradicts the truths stated by a person with a Ph.D. who specializes in fire and protection from fire damage,

Response: Weather patterns and flora conditions within the Prairie project are unlike those you are attempting to attach similarities described by the person with a Ph.D. you are alluding.

47. Comment: This timber sale is inconsistent with what the public wants the agency employees administering the national forest to do as documented in the USFS-authored document: Gen. Tech. Rep. RMRS-GTR-95. Explain why you feel that you have been given the authority to violate the public trust.

Response: We are not violating the public trust by proposing the Prairie. We are implementing a valid Forest Plan.

48. Comment: There is no "timber famine" as the USFS has been so fond of predicting for many decades. There is no shortage of raw materials for paper and wood products in the United States otherwise the owners of private timberland would not be exporting their lumber. The public doesn't want their public land logged and there is no economic need to log the trees. Therefore the Responsible Official is logging to:

1) further his career by attempting to meet the Forest Supervisor's volume expectations, and
2) spend every penny of timber $$ to assure a similar timber allocation next year.

Response: The proposed actions are related to ecosystem health. Failure to implement this project would have negative effects on (not an all-inclusive list):

sustaining forest plant and animal communities;
species dependent on early seral habitat;
treating non-native invasives;
creating/restoring wildlife openings;
improving stream habitat;
installing stream passages;
improving lake habitat for fish;
reducing fuel loading;
increasing site distances into the forest;
reducing mineral and water stress on residual trees;
additional OHV routes for riders to utilize;
the ability to decommission 5.2 miles of roads.

49. Comment: The chemicals listed above kill aquatic life even if the concentrations of the chemical in water are very low. Fish deaths will occur in the streams in the project area and the herbicide toxicity will extend many miles downstream. Herbicides must never be allowed to contact water … even so-called aquatic-safe herbicides.

Response: We realize that the use of herbicides is somewhat sensitive in all projects including this one. There are 11 mitigation measures associated with this project designed for the protection of the environment.

50. Comment: Please comply with 40 C.F.R. § 1502.9(a) by responding to each opposing view in **Attachments #9a and #18.**

Response: 40 CFR 1502.9(a) is referring to environmental impact statements. This project is being prepared as an environmental assessment since this project does not contain any actions that would result in a significant direct, indirect or cumulative effect that could not be mitigated. Proposed actions with this project area are considered specific in scope and do not preclude meaningful analysis.

51. Comment: Deputy Ranger Kopack, I know the game. The line officer receives timber funding for each FY. This is used to pay all your employees who spend all or part of their time planning, preparing, selling and administering timber sales. You know all the $$$ must be spent each FY or your funding will be less next year and you will be reprimanded by your supervisor. Thus, you are forced to sell timber sales whether they are justified or not based on the advice of your timber staff and/or TMA who are paid to "get out the cut." You reject the statements by over 100 independent, unbiased Ph.D. biological scientists who describe the ecosystem damage caused by timber sale activities.

Response: Mr. Artley, there are no games being played here. We are managing the forest responsibly and it will benefit the environment and the public.

52. Comment: Deputy Ranger Kopack, I have seen it before. When the end of the FY is approaching there is a frantic effort to find a timber sale anywhere, which means creating untrue reasons for the sale after the fact in the Purpose and Need after the merchantable trees have been found.

Response: This EA is being prepared for future implementation. Timber sales are not expected to begin before 2016. Reasons for the need for this EA are not fabricated in a means of justifying the proposed actions. We are simply implementing the Forest Plan.

APPENDIX F. TIERED DOCUMENTS AND REFERENCES.

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